



CHEETAL

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The Wildlife Preservation Society of India

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Nos.3&4



Black Buck (*Antelope cervicapra*) Female

Photo - Bhagat Singh



Himalayan woodpecker(*Dendrocopos himalayensis*) &
White collared Blackbird (*Turdus albocinctus*) male & female
Photo - Bhagat Singh



Grey tit (*Parus major*) Feeding young ones
Photo - Bhagat Singh

The Tiger



*Tiger, tiger, burning bright.
In the forest of the night:
What immortal hand or eye
Could frame thy fearful symmetry?*

*In what distant deeps or skies,
Burnt the fire of thine eyes?
On what wings dare he aspire?
What the hand dare seize the fire?*

*And what shoulder, and what art,
Could twist the sinews of thy heart?
And when thy heart began to beat,
What dread hand? and what dread
feet?*

*What the hammer? what the chain?
In what furnace was the brain?
What the anvil? what dread grasp
Dare its deadly terrors clash?*

*When the stars threw down their
spears,
And watered Heaven with their tears.
Did he smile his work to see?
Did he who made the lamb make thee?*

*Tiger, tiger burning bright
In the forest of the night:
What immortal hand or eye
Dare frame thy fearful symmetry?*

William Blake (1757-1827)

Readers View

G.C. Mishra IFS (Retd.)
Director, Tiger Haven Society

Camp Office : E-29 A, R.K. Puram
Kalyanpur (West). Licknow - 226022

To: Shri AS Negi, IFS(Retd)
Executive Vice President
Wildlife Preservation Society of India
7-A Astley Hall,
Dehradun-248001(Uttarakhand)

11th September 2007

Sub: Institutional Life Membership of WPSID to the Tiger Haven Society
Ref: Your letter dated 31st August, 2007

Dear Sir,

Your letter under reference along with membership proforma was to hands yesterday only. It was really heartening to hear from you, after a long gap. Your proposal to institutional membership of your society is most welcome. Had I not been associated with the Tiger Haven Society (THS) I would have gone in for my individual membership.

I take this association between your society and that of ours as an opportunity for jointly serving the common cause of wildlife preservation. Through this association we may keep in mutual touch in organising seminar/workshops etc. and thereby sharing our thoughts pertaining to our common goal. It needs no emphasis that wildlife is most threatened at present. It has become imperative to come forward aggressively to create mass awareness for which some concrete field activity is essential since precept is always more powerful than preaching.

Wildlife Preservation Society of India, Dehradun(WPSID) has been serving the cause of wildlife for last half a century. In comparison to this THS is quite nascent, established in 2002; nonetheless our President Billy Arjan Singh has a long record of crusading for the cause of wildlife in general and tiger in particular. He needs no introduction to the persons having interest in wild life conservation. I hope you are aware that he was recipient of prestigious Paul Getty award of 2004.

Kindly find DD no. 540965 dated 11.9.07 payable at Syndicate Bank, Dehradun for Rs.3500/-only as life institutional membership of WPSI, Dehradun issued favouring Hon.Secretary, (WPSID) along with membership proforma duly filled up. As per provisions you are supposed to send two copies of the quarterly journal "Cheetal". If not inconvenient, please arrange to one copy directly to our President Billy Arjan Singh, Tiger Haven, Palia, Kheri-262902 and the copy to me.

Encl:DD and proforma a/a

yours truly,

(G.C. Mishra)

Brigadier R. Soharanjan
(Retd.) F.I.E.

1-2-593/43-A
Gagan Mahal Colony
Hyderabad - 500029
Telephone : 040-27631882

My dear Mr. Negi,

First of all I must thank you for the 'CHEETAL' that is sent to me, which gives me much delight to read, and even pass on to few friends to see the contents.

In vol 45 which I received a few days ago, one of the articles was by Mr.T.S.Kunwar, about Sri Narain Singh Negi. I wrote to him yesterday, and just before posting the letter today, decided to send you a photo-copy of my letter, which was rather spontaneously dashed off ! Your getting his article in "CHEETAL", I do feel, was so good of you.

We have not been in correspondence for quite a long time but receiving the magazine and seeing your name keeps reminding me of you !

Warm regards.

Yours sincerely,

Enclosed: Photocopy of letter to Kunwar.

Dear Mr. Kunwar,

I have read your excellent article, a tribute to Sri Narain Singh Negi, in CHEETAL Vol.45 which I have just received.

What a fine and dedicated person he is, not only to his professional matters but caring for his family members. It was particularly interesting what you said about him since his joining Corbett National Park in 1962.

Sri Negi's outstanding leadership qualities have been so well brought out in your article. Very thoughtfully, the Editorial Board has published it. One can learn about leadership qualities on reading your "For Whom The Bell Tolls".

You have brought out matters like the great importance of personal example, facing hardships cheerfully, with patience, caring for your service subordinates, winning the confidence of all including your superiors at all levels, making improvements whenever you can, enthusiasm in doing things which helps build high morale even if undergoing hardships, and so on. All are the qualities which make for one's personal happiness in life!

Incidentally, I have been for decades a life member of The Wildlife Preservation Society of India, and for a while the Society's sole representation in South India, even though there was only little to do but then I was able to help in the setting up of a large deer park in the vicinity of Hyderabad starting with a thousand acres & it is now more than that, with Mr. Pushp Kumar, later Chief Conservator Forest Dept of Andhra Pradesh. It started by introducing Black Buck with some Albino, as suggested by the late His Highness Maharaja of Nabha who I used to meet at Delhi when I posted there on occasions & of course at Dehra Dun when attending some meetings. All this was quite long ago!

In concluding this rather lengthy letter, let me again congratulate you for the fine article, a tribute to, as you have called Sri Narain Singh Negi, a personality who is still delivering lectures on wildlife and its management.

All good wishes,

Yours sincerely,

Tele Mil : 6408

Junior Leaders Academy

PIN 900496

C/O 56 APO

2334/TT/JLA

13 Oct 2007

Shri AS Negi, IFS(Retd)
Executive Vice President
Wildlife Preservation Society of India
7-A Astley Hall, Dehradun

GUEST LECTURE ON ENVIRONMENT AND ECOLOGY

Ref your visit to this Academy for delivering guest lecture on 'Environment and Ecology' on 31 Jul 2007. The lecture on the above subject delivered by you on 31 Jul 2007 was well received by the students and the directing staff of this Academy. Keeping in view the request made by the faculty, it is requested that to please let us know your availability in between 08 Nov 2007 to 02 Dec 2007 for delivering one more lecture on the above subject in Hindi only. We are eager to hear from you and will be thankful for your acceptance and early confirmation of date.

It is for your kind info that Rail fare to and fro will be borne by this Academy.

(Rishi Wahi)
Lt Col
HOTT
For Comdt

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Gender: The Missing Link in Environment Conservation Aditi Kapoor

सतत संरक्षण में वन्य जीव पर्यटन की भूमिका ए0एस0 नेगी

From the Archives of "Cheetal"

(I) IS MOUNTAIN QUAIL EXTINCT?

I.S. Negi, I.F.S. (Retd.)

(II) MUSK

Cheetal Quarterly News

Cheetal Young Readers Section

Should man Conquer Nature?

Sumit Sinha

सांप अपनी केंचुली (Skin) क्यों बदलते हैं?

Super Birds

Wildlife Photo Series for Identification

A new species of *Liocichla* (Aves: Timaliidae) from Eaglenest Wildlife Sanctuary, Arunachal Pradesh, India

Ramana Athreya

Athreya, R.2006. A new species of *Liocichla* (Aves: Timaliidae) from Eaglenest Wildlife Sanctuary, Arunachal Pradesh, India. *Indian Birds* 2

(4): 82-94. Publication date: 8 September 2006.

Ramana Athreya, National Centre for Radio Astrophysics (TIFR), P.O. Bag 3, Pune University Campus, Pune 411007, India. Email: rathreya@ncra.tifr.res.in

This paper describes a new bird species of the genus *Liocichla* discovered near Eaglenest Wildlife Sanctuary in western Arunachal Pradesh, India. While the taxon most closely resembles *L. omeiensis*, an endemic of China, the many points of difference in plumage, size and vocalisations indicate a new species. The known population is very small and only three (breeding?) pairs responded to song play-back in May 2006. The plumage and the vocalisations are distinctive and therefore the paucity of records suggests a small and highly localized population.

1. A new species of *liocichla*

1.1 The genus *Liocichla*

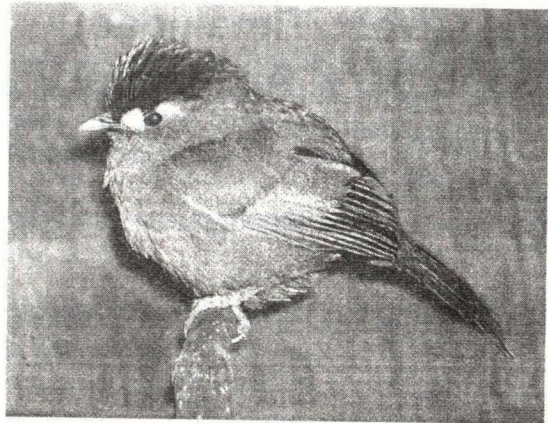
Liocichlas are an Asian babbler genus hitherto comprising three allopatric species. Red-faced *Liocichla Liocichla phoenicea* (Gould, 1837) [formerly Crimson-winged Laughingthrush *Garrulax phoeniceus*] is widely distributed from north-eastern India to north-western Vietnam through northern Myanmar, southern Yunnan (China), north-western Thailand and northern Laos (Ali & Ripley 1987; Dickinson 2003). Emei Shan *Liocichla Liocichla omeiensis* Riley, 1926 (also spelt Omei Shan) was for long thought to be confined to the Emei Shan Mountain in Sichuan (China) though recent observations have extended its range north-westward and southward (BirdLife International 2006). Steere's *Liocichla Liocichla steerii* Swinhoe, 1877 is endemic to Taiwan (Dickinson 2003). The genus was erected by Swinhoe (1877) while

describing *L. steerii*, which he said was, "...in general characters a *Liothrix* [sic], but with the stronger legs and shorter wings of a *Garrulax*..." Though not uncommon, *L. omeiensis* is classified as Vulnerable (BirdLife International 2001) because of its localized distribution and attractiveness to the bird trade. The other two species are not at risk.

1.2 Discovery of the Eaglenest taxon

On 12.i.1995, while birdwatching in Eaglenest Wildlife Sanctuary (27°02'-09'N 92°18'-35'E; 200-3,300 m), West Kameng district, Arunachal Pradesh, India, I had brief views of a pair of *liocichlas* which did not fit any description in Ali & Ripley (1987). My next sighting was of a flock on 3.i.2005 in the same locality. I saw them a second time on the same day and again on the next. From my field sketch Dhananjai Mohan identified the bird as *L. omeiensis* using MacKinnon & Phillipps (2000), though it was not clear whether the bird was identical

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Pic.1.

or merely very similar. The nearest record of *L. omeiensis* is over 1,000 km from Eaglenest. Pratap Singh, Dhananjai Mohan and I obtained mist-netting permits from the Forest Department, but failed to see the bird during two spells of observation, 23-28.i.2005 and 5-10.v.2005. I renewed my efforts on 21.v.2006 and finally netted a bird on 25.v.2006, releasing it in the same area on the same day after obtaining photographs and detailed notes on its plumage. The similarities between the Eaglenest taxon and *L. omeiensis* suggest that they are closely related, but the many differences in plumage and vocalisations—especially song—indicate a new species and therefore I propose to name it:

Bugun *Liocichla* *Liocichla bugunorum* sp. nov.

2. Description of the new species

2.1 Holotype and associated material

The holotype is the bird from which a few feathers were obtained and which is the subject in a series of photographs presented in this paper. The holotype was captured, photographed, measured and released on 25.v.2006 at Lama Camp (27°15'71"N 92°46'01"E) near Eaglenest Wildlife Sanctuary, Arunachal Pradesh, India. Rectrices from the distinctive tail,

which distinguish it from its congeners, one secondary flight feather from the wing and the photographs included here have been deposited in the collection of the Bombay Natural History Society, Mumbai, India (D.B.No.3/2006, Reg. No. 28981).

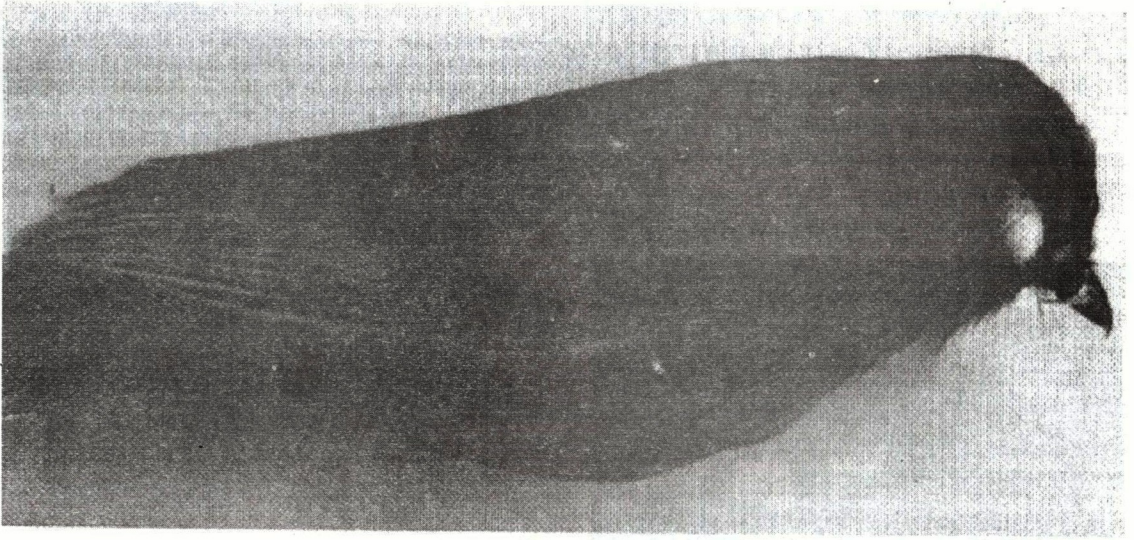
2.2 Diagnosis

The new species, an obvious *Liocichla* (including the marked *Leiothrix*-like jizz), has the overall colour olive with a black cap, prominent orange-yellow lore (between the eye and the upper mandible, not including the forehead) and yellow post ocular spot (Pic. 4), and patches of golden yellow, crimson and white on the wing (Pic. 1). The olive is greyer above (Pic. 6) and bright yellowish on the breast (Pic. 9). The closed tail is blackish above and flame-coloured below with a prominent orange-red tip (Pics. 10 & 12). The bird is very different from the sympatric Red-faced *Liocichla* but more similar to the other two species, especially *L. omeiensis* (Pic. 2). This latter species has a grey cap, less prominent lore and post-ocular markings, grey underparts, and an olive tail with black bars above (Pic. 11) and just a tint of red on the underside with yellow tips to the outer rectrices (Pic. 15). *L. steerii* shares the brighter underparts and, to an extent, the prominent lores of *L. bugunorum* but its wing pattern, tail and cap are very different.

2.3 Description of the holotype

Overall: Olive; the duller greyish-olive above (Pic. 6) appears greener in the shade and greyer in bright light (including camera flash-Pic. 1); a grey band separates the yellow-olive of the chin from the brighter yellow-olive of the breast (Pics. 1, 3 & 8); the bright colour of the breast fades into dull olive grey on the lower abdomen.

Head: The black feathers of the cap are erectile (Pics. 3-4) the ear coverts are grey

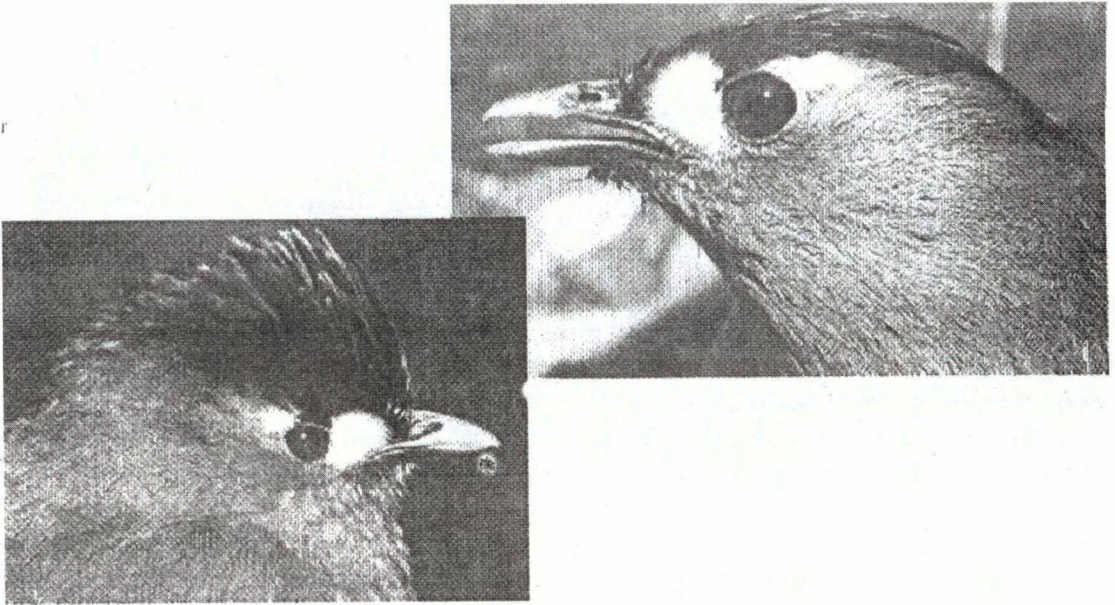
**Pic.2.**

while the rest of the sides of head including the chin and a crescent behind the ear are different shades of brighter olive (Pic. 3); a prominent triangular orange-yellow loreal patch and a bright yellow post-ocular streak (against upper half of eye) give a spectacled appearance (Pic. 3); the two striking features are separated by a black area about half the diameter of the eye.

Wings: There is extensive golden yellow at the base of remiges (with some reddish tinge), on adjacent coverts and along the lower edge of the closed wing (Pics. 1 & 6); there are 17 remiges with nine primaries (Pic. 7); the sixth primary is the longest but the seventh and eighth are only a little shorter (Pic. 7); the tips of remiges vary from acute (first primary) to flat (last secondary); the remiges have black shafts (any white on the shaft in the photos being camera flash highlights) and are mostly slaty-black with the amount of yellowish-olive increasing inwards from the first primary; all the secondaries have a crimson drop on their outer edges, close to the tip, which form the sub-terminal crimson patch on the closed wing; all the remiges are tipped white, the secondaries more

prominently (Pic. 8) the yellow on the primaries is narrower than that on the secondaries but extends further along the outer web resulting in the yellow lower edge of the closed wing (Pic. 1). The secondaries also have a white streak between the crimson drop and the golden-yellow at the base.

Tail: Square-tipped central tail feathers with outer rectrices progressively shorter resulting in a graduated appearance; the holotype had nine tail feathers; Pic. 12 clearly shows that some feathers are missing; the tail is mostly blackish above with indistinct darker bars (Pics. 6 & 10); the tips of the outer feathers have some olive; all the feathers end in a spray of orange-red barbs, which emerge as a tuft at the point of the shaft (Pics 10, 12 & 13); the underside of the tail (Pic. 12 & 14) is spectacularly colourful-the outer two pairs are flame-coloured while the inner feathers progressively become more olive (with some black barring) and finally black (Pic 12); the shafts change from brownish to bright yellow in the outer third of the tail; the outer pair of undertail coverts are black



Pic.3.1.

with broad red terminal edges and bright yellow lateral margins while the inner pair lacks the yellow.

Bare parts: The eyes are dark reddish-brown; the bill is pale translucent horn in colour distally and darker and more opaque in the basal half (Pic.3); the legs and feet are flesh coloured.

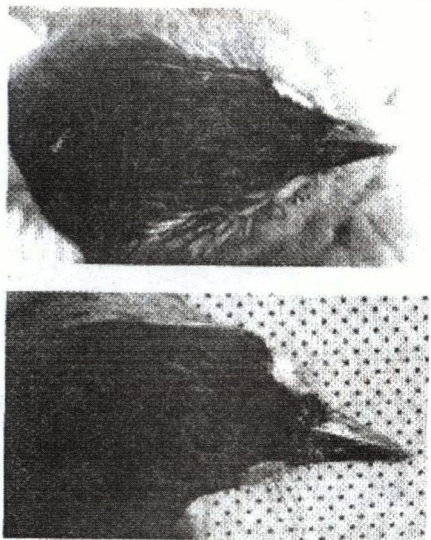
Measurements: The total length was measured with the squirming bird stretched out and hence should be treated as approximate. Other measurements were taken with the bird held more securely and with Vernier calipers and hence are accurate to a millimeter or better. Total length 220 mm (approx.); bill: skull to tip 14mm, along gape 18.5 mm, maximum depth 6 mm; wing chord 85 mm; tarsus 32 mm; tail 95 mm.

2.4 Other individuals

Another bird "Bird #2" had been netted earlier on 21.v.2006 in the same area (within 10 m of where the holotype was netted) but escaped after only a few

photographs had been taken. It differed from the holotype in the duller yellow-olive on its wings, much duller copper-red on underside of tail, no red in undertail coverts and in having broad yellow tips to tail feathers. The colours of the bare parts of Bird #2 were as of the holotype. Bird #2 has been depicted in some photos in this work.

Though the two birds were not sexed, the plumage differences between the holotype and Bird #2 are perhaps due to their differing sex. All the birds seen in May 2006 (breeding season at 2,300 m) were in pairs, while small flocks were seen in January 2005. Furthermore, the holotype was distinguishable in the field on account of its missing tail feathers and I never saw it outside that area nor did I see any other "male" in that area. These two factors suggest that the two netted birds were an adult (breeding?) pair and not an adult-subadult combination. The plumage differences between the two-bright red on



Pic.4.

the ventral side of the tail of the holotype being replaced by fainter red or yellow in Bird #2, and the duller wings of the latter suggest that the holotype is a male and Bird #2 a female. It may be noted that the male and female labels in the photo captions are enclosed in quotes, indicating that proper sexing was not carried out.

During observations on 3.i.2005 I had noted a second reddish wing patch at the base of the remiges (as has Fredrik Ellin in March 2006, *verbally*), similar to that in *L. omeiensis*, but this was not seen on any bird in May 2006. The crimson at the base of remiges in *L. omeiensis* has been reported to abrade by Hewston (2004) who also claims that if present the second wing patch is an easier means of sexing a bird but the constant difference in tail colour is more reliable in this respect. Pic. 1 does show a reddish tinge on the golden-yellow base of remiges.

2.6 Vocalisations

The song of *L. bugunorum* was first noted by Ellin and Peter Schmidt at Lama Camp on 24.iii.2006. Subsequently, at the same

location on 9.iv.2006 Margaret Widdowson, Michael Catsis and I recorded the song on tape and played it back to call the birds out. Pic. 16 Displays sonograms of four different vocalisations. The bottom-right portion of the montage shows them juxtaposed for comparison. The vocalisations may be *L. bugunorum* holotype and Bird #2. The holotype and Bird #2 are probably male and female, respectively. The crests of both sexes are erectile.

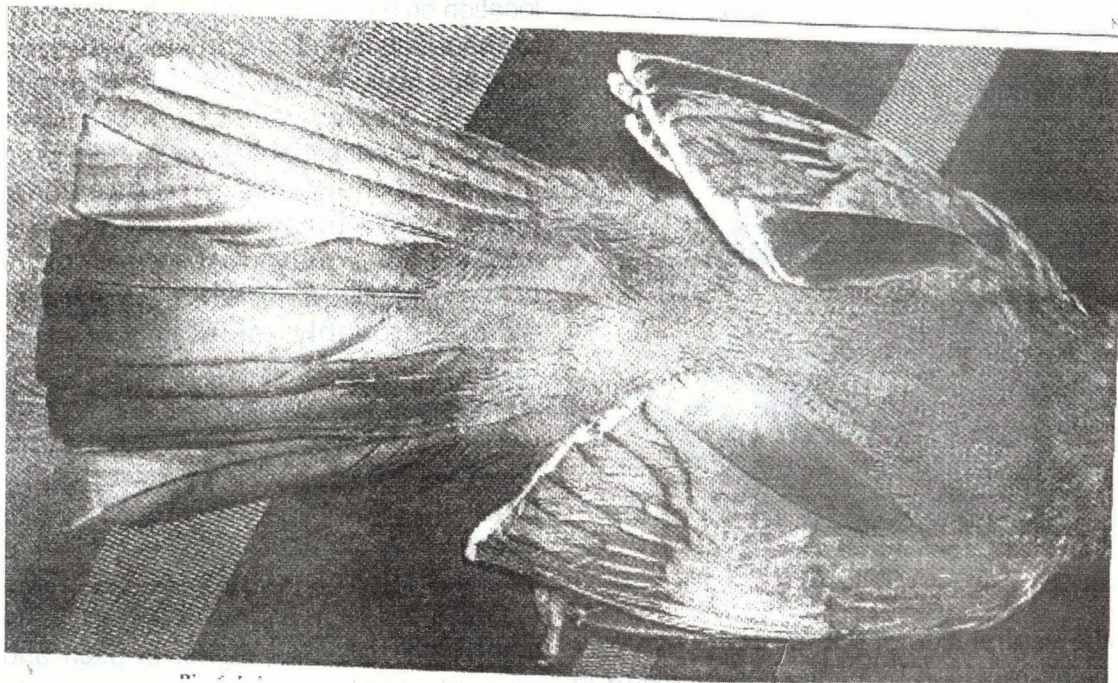
transcribed as: 16A "weee-keew" 16.B "you-weee-keew" 16.C "wieu. u-wee.i-tuu.i-tuu.uw-tu.oow", these notes on a descending scale, slightly slurred and inflected at the end 16.D "weei.u-tuuu.i-tuu.uw-tu.oow", these notes similar to the last four of 16.C but higher in pitch and more stressed.

The initial consonant is barely audible in all these notes.

All the notes are fluty, usually with a terminal inflection and quite distinctive. The vocalisations 16.A-16.C are part of a longer sequence of a bird responding to song



Pic.5.



Pic.6.1.

playback on 9.iv.2006. 16.C is similar to that described by Ellin & Schmidt (*pers. comm.*) and is probably the "normal" song. However, the song can start from any of the five notes and end at any subsequent note but always with the notes in that sequence. 16.D was the bird's preferred response to playback in May 2006; it is similar to 16.C but higher in frequency and missing the first note. 16.A seems to be a subset of 16.B with a minor variation.

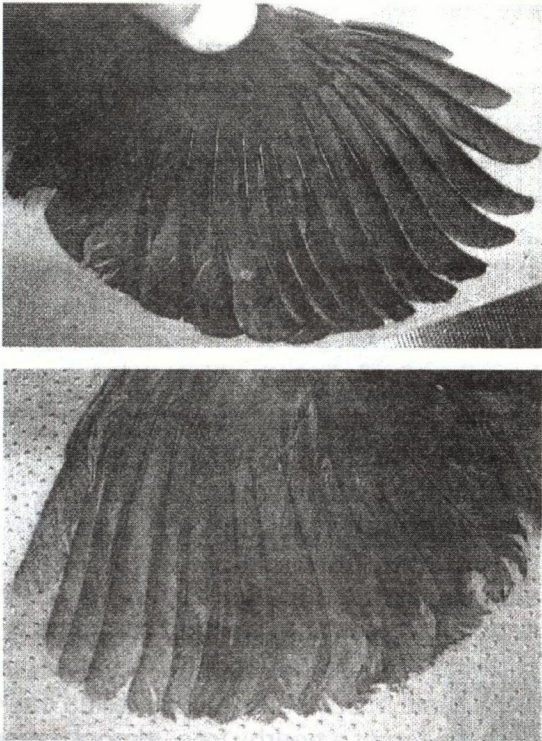
2.7 Similar species

L. bugunorum is very different in plumage from the sympatric *L. phoenicea*. It has a mixture of features of the other two *liocichlas* though it seems to be closer both vocally and visually to *L. omeiensis*.

The principal morphological differences between *L. omeiensis* and *L. bugunorum* are listed in Table 1. The latter is about 10% larger in size in all measurements, except the bill which is smaller. However, it must be noted that with just a single specimen I have no information on the intra-specific

variations of these values. *L. bugunorum* has a black cap vis-a-vis grey with dark brown forehead in *L. omeiensis*; two clearly separated features straddling the eye vis-a-vis a somewhat broken eye-ring-including a large, bright, orange-yellow triangular lore spot vis-a-vis most of the lores being dark brown; forehead black vis-a-vis brownish; crescent behind ear coverts olive vis-a-vis reddish-brown; bright yellow-olive underparts vis-a-vis grey; mostly blackish uppertail with indistinct darker bars vis-a-vis olive with black bars; underside of tail (essentially the underside of the two outermost tail feathers) flame-coloured vis-a-vis olive with a faint reddish tinge; tips of outer rectrices have orange-red tips vis-a-vis broad yellow tips.

L. steerii differs from *L. bugunorum* in having a grey crown streaked with white, a differently shaped pre-ocular spot, grey rump contrasting with olive back, an olive upper tail with white tip and lack of red in



Pic.7.

under tail coverts.

Sonograms of *L. omeiensis* and *L. steerii* from recordings in Scharringa 2006 are shown in Pic. 17 and 18, respectively. Another version of the *L. omeiensis* song has been transcribed as "w'yii'-i-w'yii-u-w'yiiwi-w'yii-u" (BirdLife International 2003).

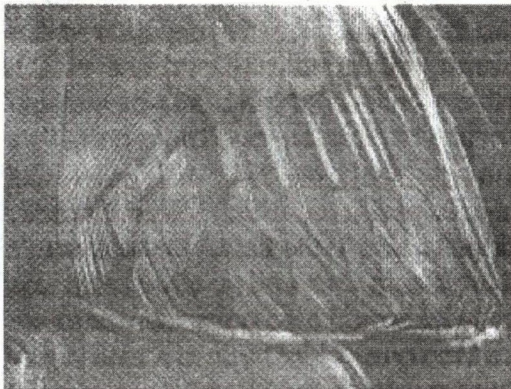
The *L. omeiensis* recordings in the British Library Sound Archives and others provided by Per Alstrom are similar to those in Pic. 17. The vocalisations of *L. steerii* are clearly different from those of *L. bugunorum*. *L. omeiensis* vocalisations have a similar quality of those of *L. bugunorum* but the individual notes of the latter are simpler, i.e. with less modulation vis-a-vis multiple peaks, and more rounded vis-a-vis sharper structures, and the notes of the song descend farther in pitch.

3. Ecology

3.1 Sight records of the species

Prior to May 2006 *L. bugunorum* had been seen on:

- i. 12.i.1995. A pair in late afternoon at Lama Camp, Location 1.
- ii. 3.i.2005, 15:00 hrs., 2,320 m. A flock of six with Cutias *Cutia nipalensis* at Lama Camp, Location 1.
- iii. 3.i.2005, 15:45 hrs., 2,250 m. A flock of four with Red-headed Laughingthrushes *Trochalopteron erythrocephalus* at Lama Camp, Location 2.
- iv. 4.i.2005, 15:15 hrs. A flock of six at location of sighting iii.
- v. 24.iii.2006, 06:00 hrs. A pair at Lama Camp, Location 2 (Ellin, pers. comm).
- vi. 24.iii.2006, 07:30 hrs. A singing pair,



Pic.8.

close to sighting v (by Ellin & Schmidt, pers. comm)

vii. 5.iv.2006, 07:00 hrs. More than two birds with Blue winged Laughingthrushes *Trochalopteron squamatum*¹ at Location 3 and on 7.iv.2006, 11.00 hrs., over three birds with Red-headed Laughingthrush and Bar-throated Minla *Minla strigula* between Locations 1 & 2 (Marques 2006; Ritschard 2006).

viii. 8.iv.2006, 07:00 hrs., 2,060 m. A flock of four, 2 km above Bompou, 27°04'32"N92°24'07.6" (Simon Allen, Michael Catsis, Margaret and William Widdowson, and I).

ix. 9.iv.2006, 07:00 hrs. A singing pair, Lama Camp, Location 2 (observers of viii).

3.2 Habitat and habits

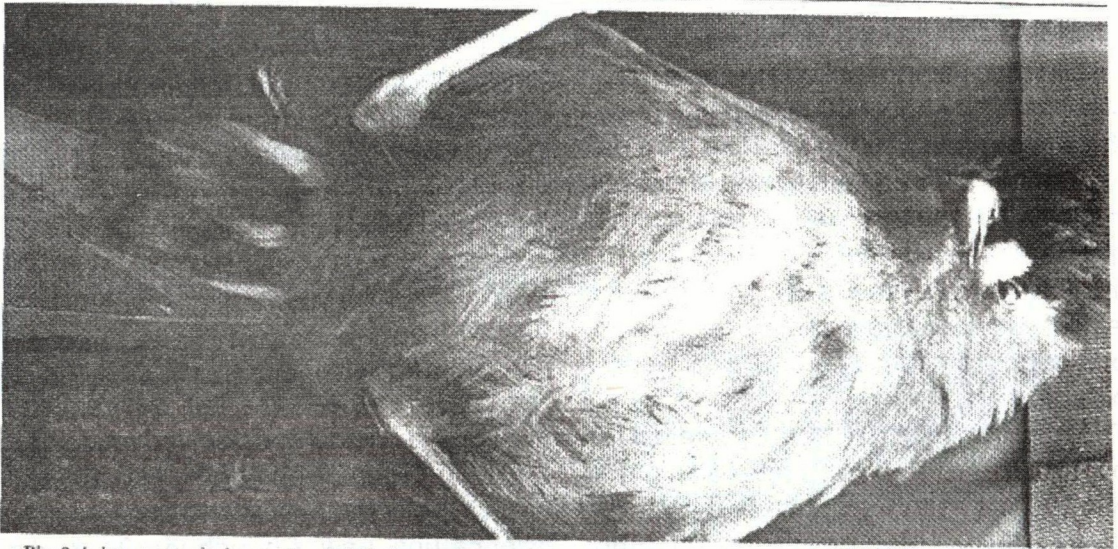
All sightings except one have been on heavily disturbed hillsides (2,060-2,340 m) with dense shrubbery and small to medium sized trees (remnants after extraction of tall timber). Only the Bompou sighting was at the edge of primary forest. Clearly, the species can exist in disturbed areas and utilize a variety of vegetation types. This is more or less identical to the habitat preference of *L. omeienses* (BirdLife International 2003). In both cases, this versatility regarding habitat usage is somewhat at odds with the small, highly localised population. *L. bugunorum* has been observed at all heights- from the ground to the canopy of tall trees (30m), hopping on the ground, working through the undergrowth, in tangled vines and even tree-creeping like *Cutia nipalenses*.

L. bugunorum have been observed in flocks of 2-6 birds in January. In April, they were seen in pairs as well as in small flocks. In May, all sightings were of pairs. They have been seen by themselves or in the company of, variously, *C. nipalensis*, *T. erythrocephalus*, *T. squamatus* and

Minla strigula.

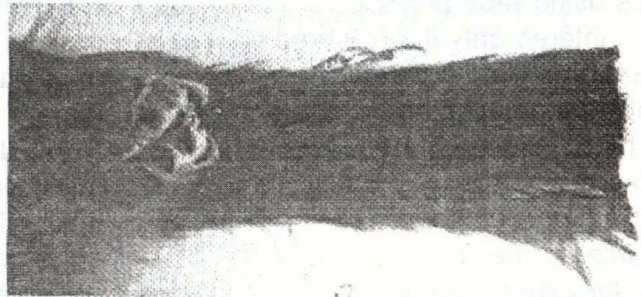
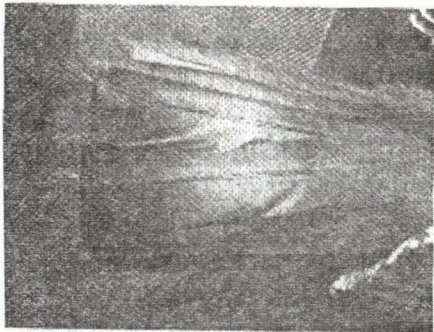
While they frequent dense shrubbery they seem not to be particularly shy and a substantial fraction of the sightings have been in exposed situations.

During the week starting 21.v.2006 three pairs of birds responded to song playback- one (pair 1) right at the Phua Rung camp site, another (pair 2) about 400m lower down the ravine, and the third (pair 3) at Location 2. Pair 1 readily responded to playback on most days, especially early in the morning and in the afternoon. On the first day, the birds approached quite close, moving about in shrubbery just a few meters from the audio-player. However, after the first capture/escape there was a noticeable increase in their aversion to showing themselves openly and after the first couple of days they mostly called back from the top of a nearby tree, almost never descending to the undergrowth. Pair 2 responded strongly to playback on the first two attempts, coming in from about 150 m away to investigate, but on subsequent days confined themselves to an occasional response from far away. Pair 3 always responded to playback but they rarely approached closer than 50 m from the observers. Therefore, while playback seems to be a good tool for drawing out birds, the intensity of the response varies between individuals and perhaps on the relative locations of the audio-player and the centre of their territory. The male of Pair 1 (the holotype) lacked two of its outermost right-side rectrices, which made it readily distinguishable in the field. I never saw this bird anywhere else and no other male was seen in its area. I also never saw or heard more than one pair of birds at a time at any of the three locations. While one cannot make a definitive statement in the absence of individually marked birds, these



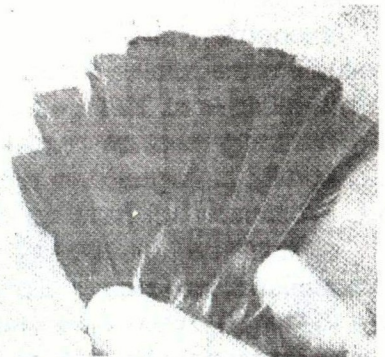
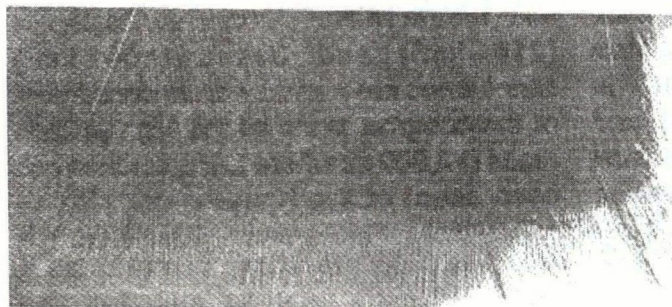
Pic. 9. *L. bugunorum* holotype "male". Both sexes have yellow-olive underparts, brightest on the breast and fading into a duller shade on the belly.

Pic. 10. (below) *L. bugunorum* holotype "male". The upperside of tail is predominantly black with indistinct darker bars. The fraction of olive green increases towards the outer rectrices.



Pic. 11. *L. omicinsis* male. The barring on the uppertail is more prominent as the ground colour is lighter.

Pic. 12. (right) *L. bugunorum* holotype "male". The pattern on right-most feather makes it the counterpart of the third outer feather on the left suggesting that two feathers on the right are missing. The odd count suggests that a third feather may also be missing.



Pic. 13. (left) *L. bugunorum* holotype "male". The terminal orange-red barbs form a denser tuft at the location of the shaft. The terminal section of the shafts are yellowish.

observations are consistent with pairs inhabiting well-defined territories.

The first two pairs inhabited the same ravine separated by about 400 m distance (along the slope) and c. 100 m alt.. The third pair frequented the adjacent ravine about 300 m away. These pairs readily responding to playback, at least initially, and vocalised on their own several times daily. Therefore, the lack of vocalisations including response to playback from other areas with similar habitat is surprising.

The only numbers one can put against the population are four birds near Bompou on 8.iv.2006 and the ten separate individuals seen on 3.i.2005 near Lama Camp. Despite repeated attempts at finding the birds using tape playback in May 2006 I encountered only three (breeding?) pairs near Lama Camp and none near Bompou. While the population is unlikely to be just 14 birds, clearly, the species is far from numerous.

Pair 1 (May 2006) were observed feeding on small berries one morning. On another day, they were seen exploring the tangled vines on a tree and feeding (insects or vegetable matter?)

4. Discussion

4.1 Taxonomic status

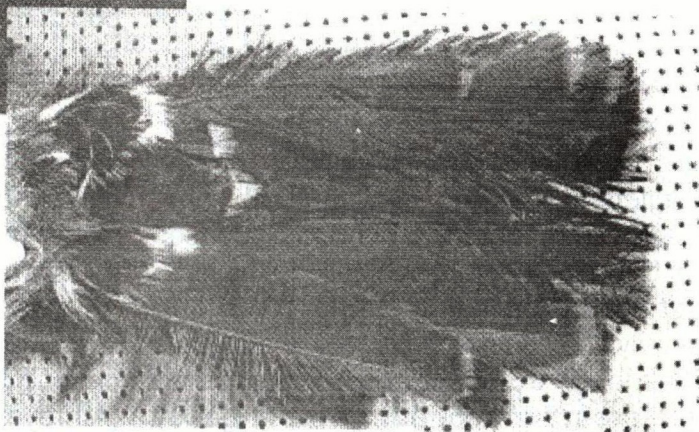
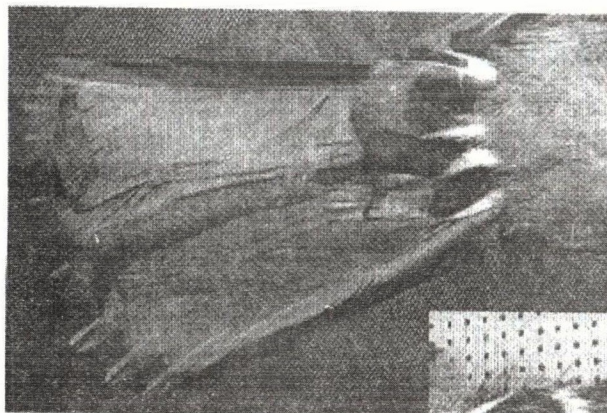
Evaluating the relative status of taxa is not easy (Helbig et al. 2002), especially when all other congeners are allopatric. Visually and aurally, *L. bugunorum* is most similar to *L. omeiensis* but there are many points of difference between them: in vocalisations, ten features of plumage, and size (Table 1). While future surveys may extend their ranges towards each other the balance of probability of finding intermediate populations, showing a cline in all the above differences is low. Furthermore, *L. bugunorum* differs from *L. omeiensis* and from *L. steerii* in its plumage

as much as the latter differ between themselves. *L. omeiensis* was elevated from subspecies (of *L. steerii*) to species (Cheng 1987). These factors make a strong case for assigning specific rank to the Eaglenest taxon.

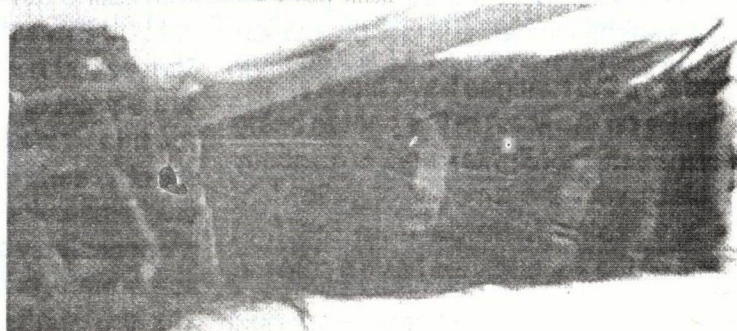
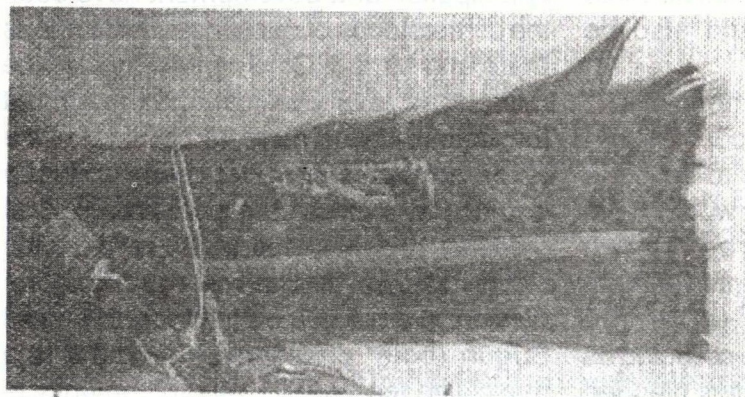
4.2 Status and conservation

L. bugunorum is presently known only from Eaglenest. The species may eventually be discovered in adjacent Bhutan and also further east in central and eastern Arunachal Pradesh but the fact remains that despite being spectacularly colourful and quite distinctive in both plumage and vocalisations the species was unknown to science until now. Choudhury (2003) did not encounter this species while surveying Eaglenest for birds over many visits across several years, which suggests that the population, even in Eaglenest, may not be large.

All sightings of *L. bugunorum* except one have been in Lama Camp, a heavily logged tract, within the Bugun community forest area just outside Eaglenest Wildlife Sanctuary; the one exception falls inside the boundaries of Eaglenest. Eaglenest is a part of the much larger Kameng protected area complex spread over 3,500 km² of contiguous closed canopy forest in East and West Kameng districts of Arunachal Pradesh and adjacent Assam covering an altitudinal range of 50-3,300 m, the largest such area in western Arunachal. Eaglenest (218 km²) and Sessa (100 km²) sanctuaries are a small critical constituent of the complex since all the high altitude areas (>2,000 m; where *L. bugunorum* has been seen) of the Kameng complex lie within them. Furthermore, Eaglenest is a microcosm of the entire complex as it contains within itself all altitudes and vegetation types between 100- 3,300 m. Eaglenest has remained largely untouched



Pic. 14. *L. bugunorum* holotype "male" (top) and Bird #2 "female" (right). The closed underside of tail appears as a solid sheet of orange-red flame in the "male". The blue shade in the "female" undertail coverts is a camera flash artifact - the actual colour is black.



Pic. 15. *L. omciensis* male (top) and female (right). The ground colours are duller than in *L. bugunorum* but the terminal bands on the tail feathers are broader.

despite lack of efforts towards its conservation. The Eaglenest Biodiversity Project (Athreya 2005, 2006; and references therein) has focused on bringing together the Forest Department and the local Bugun community into protecting the area jointly. The Buguns are keen on preserving the area to attract birdwatchers to augment their community finances. We are also looking at ways and means of reducing the community's dependence on forest timber for fuel and construction.

A more potent threat to the area has been the plan to build a major highway through Eaglenest, passing right through Lama Camp, with unpredictable consequences for the *L. bugunorum* population. The birds survive in the Lama Camp scrub but, clearly, they do not thrive, which suggests (unknown) ecological obstacle(s) to an increase in their population; a busy highway could well push this spectacular bird into local extirpation, which could also be extinction.

4.3 On the lack of a full specimen

Given the very small known population, I felt it would be inappropriate to collect a specimen, especially as that would have affected one of only three known (breeding?) pairs. So only some feathers which had worked loose (after the photographs were taken) were collected as type material. Should the census planned for next season indicate a larger population, steps will be taken to obtain a full specimen after seeking permission from the appropriate authorities.

One could have described the taxon only after collecting a specimen after the census but several factors argued against a delay:

i. publicity from the formal description of a new and spectacular bird species would significantly facilitate our ongoing conservation efforts at Eaglenest;

ii. the areas where the birds have been seen are the subject of litigation over the construction of a major highway;

iii. Our efforts at conservation-oriented ecotourism resulted in a surge in visitors last season and a new taxon whose description is only hinging on the collection of a specimen may tempt a visitor into an illegal collection effort disrupting the small population there as well as prejudice the authorities against the ecotourism effort; and

iv. I have enough material to satisfy the technical requirements of description of a new species according to the International Commission for Zoological Nomenclature.

4.4 Etymology

All observations of this taxon, except the first, were carried out during field work under the Eaglenest Biodiversity Project (Athreya 2005, 2006). Local community participation and development have been the cornerstones of our conservation efforts there and Mr Indi Glow of the Bugun tribe has played a very critical role throughout the project. Furthermore, all sightings of the taxon except one have been in Bugun community forest. It gives me great pleasure to acknowledge the contribution of Mr. Indi Glow and others by naming the new taxon after their Bugun tribe. The word Bugun (both 'u' rhyme with "put") is a masculine term used by the community to refer to themselves. It is believed to mean "people of the valley = valley dwellers" but the etymology is uncertain and its origins may lie in another language. The specific name *bugunorum* [= (Liocichla) of the Buguns] is the invariable genitive plural of the latinised noun *Bugunus*.

Acknowledgements

Dorje Raptan, while netting the bird, and Nigel Collar, during the preparation of this

manuscript, made crucial contributions to this work. Nigel also provided photos and measurements of the two *L. omeiensis* in the Natural History Museum, Tring, U.K. After my initial sightings Fredrik Ellin and Peter Schmidt provided the major breakthrough by identifying the song of the species. Goutam Narayan, Nandita Hazarika, Vidya Athreya, Aasheesh Pittie, Mike Catsis, Simon Allen, William and Margaret Widdowson, Herman Mays, Mathias Ritschard, Aniruddha Belsare and Neelim Khaire helped at various stages. David Normand helped in getting the Latin correct. Jelle Scharringa, Mike Catsis, Cheryl Tipp (British Library Sound Archives) and Per Alstrom provided cuts of *L. omeiensis* vocalisations for comparison. A special thanks to Dhananjai Mohan and Pratap Singh for their contribution, and an apology-they traversed the subcontinent at short notice to mist-net the bird in January 2005. Unfortunately, the call I had recorded earlier, that they used, proved to be not of the *Liocichla* but of a *Leiothrix* in the same bush-I wish things had turned out otherwise! The Forest Department of Arunachal Pradesh has been very supportive of our work at Eaglenest and patient and liberal with out several requests for mist-netting this bird since January 2005. The Eaglenest Biodiversity Project, during which the new taxon was observed in detail, was supported by grants from the Rufford-Maurice-Laing Foundation (U.K) and Ford Foundation/Winrock, India. Comments and suggestions from the referees, Edward Dickinson, Pamela Rasmussen and Jochen Martens, were of great help-any shortcomings of this paper are in spite of their efforts. Dr Rasmussen strongly disapproved of naming a new species without a full specimen but nonetheless was kind enough to review the manuscript. My thanks to everyone!

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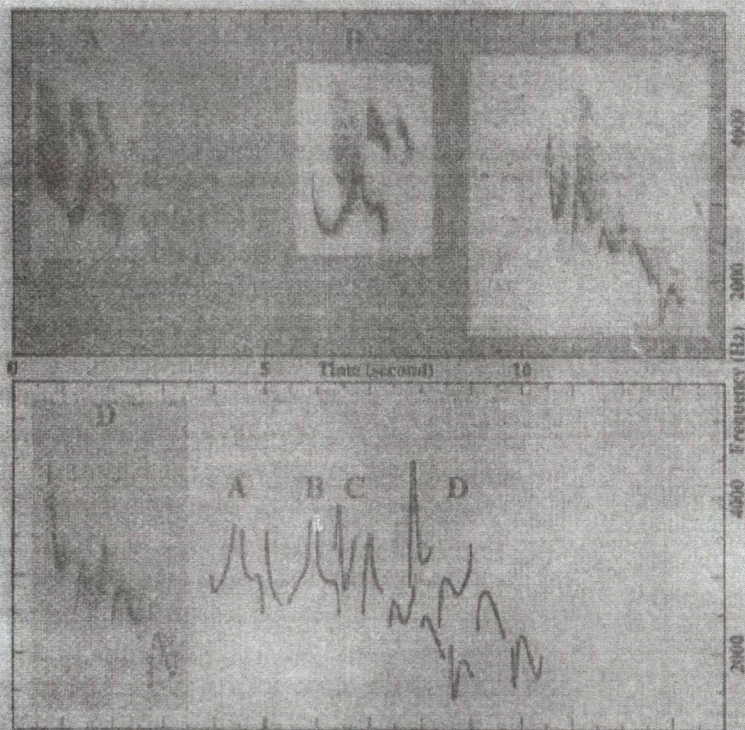
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Table 1. Principal morphological differences between *L. omeiensis* and *L. bugunorum*

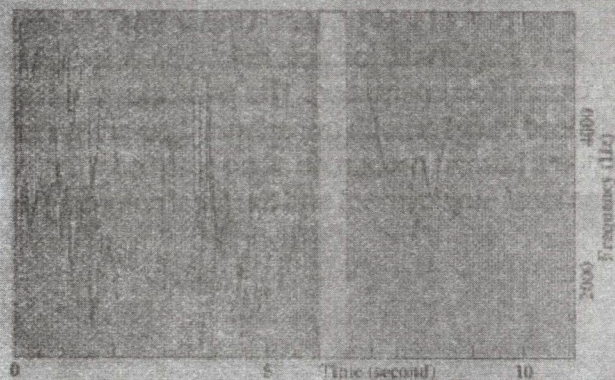
Morphological part	<i>L. omeiensis</i>	<i>L. bugunorum</i>
Crown	Grey	Black
Forehead	Bright brown	black
Crescent behind ear coverts	Reddish-brown	Bright olive
Eye markings	Pale-yellow broken eyering	Two separate prominent spots – a large triangular orangish-yellow loreal spot and a bright yellow post-ocular streak.
Breast	Neutral grey	Bright yellow-olive
Underside of tail – “male”	Just a hint of reddish	Bright orange-red
Outer tail, below – “male”	prominent yellow tips	Concolorous with rest of feather
Underside of tail “female”	1. grey with just a hint of olive 2. Broad white tips	1. olive with a strong shade of copper 2. narrow yellow tips
Uppertail	Olive with black bars	Mostly black with indistinct darker bars
Red tip to tail	Not on outer feathers	On all feathers
Total length	205 mm	approx. 220 mm
Bill from skull	17 mm	14 mm
Tarsus	30 mm	32 mm
Wing (curved)	77 mm	85 mm
tail	85 mm	95 mm

Nigel Collar provided the measurements (except total length, which was obtained from BirdLife International 2006) and photographs of two specimens of *L. omeiensis* in the Natural History Museum, Tring, U.K. The *L. omeiensis* plumage description is based on these photos and on MacKinnon & Phillipps (2000). It may be noted that the measurements are based on just one individual of each species.

The Bugun Liocichla was discovered during the field visits of the Eaglenest Biodiversity

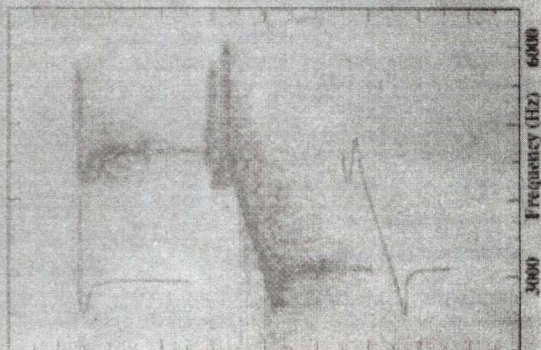


Pic. 16. This montage of sonograms displays four different vocalisations of *L. bugunorum*. All were in response to tape playback though sonogram C (red) is very similar to the un-elicited song of the bird. The bottom right collection depicts colour coded tracings of the same four vocalisations for easy inter-comparisons—they retain the temporal and frequency scale and are faithful reproductions of the ridges on the sonograms. The diffuse 3-note structures seen in sonograms A (brown) and B (cyan) are interlopers produced by a nearby Streaked Laughingthrush *Trochalopteron lineatum*, as is the similar single diffuse spur sitting above the second note of C (red). A, B, and C were part of a sequence from the same bird but the display transfer functions have been modified to minimize the contamination due to *T. lineatum*. The notes are very fluty, their quality distinctive when once heard, and usually have an inflected tail.



Pic. 17. Sonograms of *L. meiensis* from (Scharringa 2006). The temporal and spectral scales are as in Pic. 16. The overall quality of the notes are somewhat similar but look and sound quite different. The colour tracings of the ridges show the overall structure of the vocalisations but have been shifted in time and frequency from the actual ridges for clearer delineation.

Pic. 18. Sonogram of *Liocichla steerii* from recordings in Scharringa (2006). The call is at a higher frequency than that of *L. bugunorum*. The colour tracing and spectral scale of the plot is the same as for the previous sonograms but time axis is greatly magnified.



Project. Ramana Athreya initiated this project in November 2003 to improve the long-term conservation prospects of Eaglenest wildlife sanctuary. The three principle components of the conservation strategy include (i) documenting the flora and fauna (ii) identifying the factors which can affect their long-term survival and (iii) co-opting the local communities (Bugun and Sherdukpen tribes) in the conservation effort. The last component necessarily involves understanding the socio-economic needs of the two communities, their dependence on forest resources and identifying alternatives to non-sustainable exploitation of such resources. Generating employment and community revenue from ecotourism has so far been the focus of the community initiative.

The first phase of the project was completed recently and the targets achieved (to a greater or lesser extent) included basic inventories of some of the fauna of Eaglenest, demonstrating the ecotourism potential and convincing the local communities that conservation of Eaglenest can yield economic benefits. In the coming years the project will continue to carry out faunal inventories and community-organised ecotours, while expanding into nature/conservation education, understanding and reducing the dependence of the communities on forest resources and employment of local people in forest protection roles in partnership with the Forest Department.

Participation in the project is open to anyone with time, skill, resources and motivation. In fact, so little is known of the biodiversity of the area that skill is not a critical requirement—even people with minimal skills can contribute significantly towards the project goals.

Professional and amateur ornithologists may be interested in the Vacations-for-Conservation programme being organised as part of this project. Under this scheme, the project organises non-profit vacations in Eaglenest for naturalists. In return, the participants are expected to help with the faunal documentation. The participants get an opportunity to enjoy an inexpensive, organised vacation with experienced co-ordinators in a spectacular wilderness. The project gains human resources at no extra cost for the documentation work. The activity generates local employment and the local communities earn some revenue as a whole.

Ramana Athreya
Pune. India.

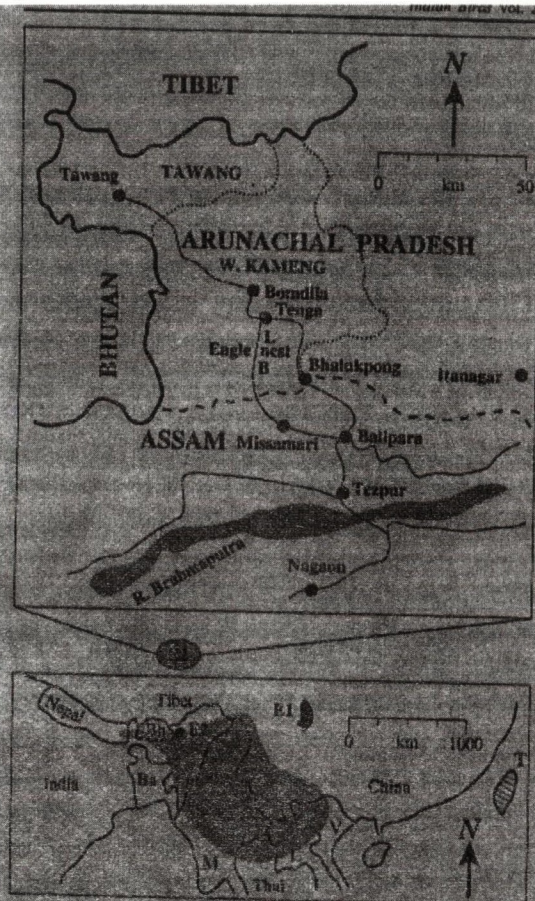


Figure 1. The bottom panel (adapted from BirdLife International 2006) shows the known ranges of the four species of *Liocichla*. The abbreviations are Bangladesh (Ba), Bhutan (Bh), Laos (L), Eaglenest (E2), Omel Shan and its neighbouring areas (E1), Taiwan (T), Thailand (Thai) and Vietnam (V). *L. shawi* is endemic to Taiwan; *L. omiensis* is confined to E1; Bugun *Liocichla* is known only from E2; the grey-shaded area delineates the range of Red-faced *Liocichla*. The upper panel provides a more detailed view of the Eaglenest area. The Bugun *Liocichla* has been recorded from Lama Camp (L) and Bompou (B), which lie along the Eaglenest road north and south of the Eaglenest ridge, respectively.

M. 2002. Guidelines for assigning species rank. *Ibis* 144: 518–525.

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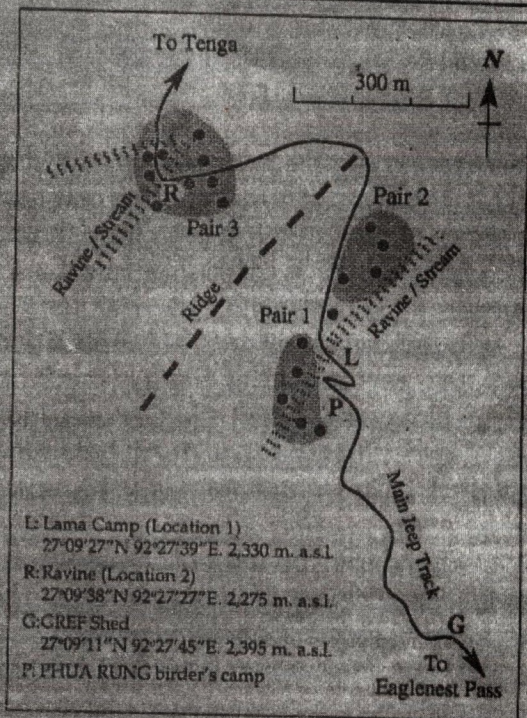


Figure 2. Lama Camp area, outside Eaglenest Wildlife Sanctuary. The dots in the grey-shaded areas denote the approximate locations of sightings of the three pairs of Bugun *Liocichla* seen in May 2006. All the other sightings, except the one near Bompou ($27^{\circ}04'32''\text{N}$ $92^{\circ}24'07.6''\text{E}$, 2,060 m. a.s.l.) have also been in this area.

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NATURAL WEALTH OF UTTARAKHAND FORESTS AND WILDLIFE

**A.S. Negi, IFS*

Uttarakhand came into existence as a State on 9th November, 2000 after reorganization of U.P. The basis of creation of the new State was its geographical location in Himalayas. Its share of geographical area from the parent State is 18% inheriting only a little over 5% population. 67% of the total forest area of the undivided UP is now in Uttarakhand. Forest area in Uttarakhand constitutes 65% of its geographical area though the forest cover is only on about 44% of the total geographical area. This is next only to Sikkim in India. In forest cover this State is much above the world average of 32.8% and is next only to Indonesia, Brazil and Canada. India's per capita forest cover is 0.08 ha. (It was 0.20 ha. in 1951) which is much below the world's average of 0.89 ha. The per capita forest cover in Uttarakhand is 0.49 ha. which is next only to Himachal and Sikkim in India.

Uttarakhand may be the only State where within a short distance we find subtropical, temperate, alpine and arctic climates. The unique feature of forests of Uttaranchal is therefore its distribution from low lying Tarai areas to the tree line around 3000 m. a.s.l. Beyond tree line there are vast and rich high altitude pastures. The extensive Sal forests in Tarai-Bhabhar extend little above the foothills, within the same area, there are miscellaneous forests with species richness and the riparian belts along wide stream beds interspersed with grasslands. After the transition zone of Sal and Chir, there are extensive forests of pure Chir-pine with Ban-oak on cooler aspects. On higher elevation. Chir-pine is replaced by pure Oak forests. On higher altitudes the forest types range from pure Deodar to mixed Kail and Deodar forests and pure Kail patches. On this altitudinal range depending upon aspect and edaphic factors, there are Moru oak forests mixed with mapples, walnuts, horse chestnut etc. The forests on still higher altitude are those of fir and spruce mixed with Kharsu oak, *Taxus bacata*, *Alnus* and variety of other trees, shrubs and bushes. The tree line consists of *Rhododendrons*, *Cotoneasters*, *Viburnum* etc. which are mostly in the bushy form.

The alpine pastures are extremely rich in rare and valuable medicinal plants. Before the snow covered peaks and glaciers, there are moranes where some rare plants grow. The Brahm Kamal, Fen Kamal and Neel Kamal can be seen on difficult slopes and screes between 3600 m to 4500 m.

The floral diversity is closely associated with the faunal richness of the State. Due to climatic, edaphic and floral diversity, the State is rich in various mammals, birds, reptiles, fishes, amphibians and insects. Approximately 14% of the State's geographical area is under Protected Area network. More than one fourth of the reserved forests comprise of the National Parks, Wildlife Sanctuaries and Conservation Reserves. Nanda Devi Biosphere Reserve, which is representative of Himalayan biogeographical zone, with

an area of 5800 km² is situated in the State. Corbett National Park situated in Tarai-Bhabar region, is the first National Park of the Indian Sub-continent established in 1936. Nanda Devi National Park situated on high altitude and encompassing the second highest peak of the world is another Jewel in the crown of Uttarakhand. There are in all 6 National Parks and 6 Wildlife Sanctuaries and two Conservation Reserves in the State with a total area of 7370 Km².

Uttarakhand has an elephant population of 1000 to 1500 which is the North-Western limit population of Asian elephants. Similarly the Royal Bengal Tiger population of about 200-250 animals is the North-Western population of tigers in its existing range, Corbett-Rajaji Tiger Conservation Unit (TCU) has been recognized as one of the important TCU by tiger experts. Uttarakhand has the distinction of having some of the rare animals and birds. Apart from elephants and tigers, some of them are, Snow leopard, Musk deer, Himalayan Thar, Blue sheep, Serow, Red fox, large population of leopards, 3 species of Bears, Smooth Indian otters, some smaller Cats, Civets, Martins, Magars, Gharials, Mahaseer fishes, two species of Tragopans, Monal pheasant, Chir pheasant, Chukor, Koklas, Black partridge, Kaleej pheasant, Peacocks, King Cobra, Python and variety of other mammals, birds, fishes, reptiles, amphibians and insects.

The broad estimation of various species of flora and fauna in the State can be given from various studies done in Corbett National Park and Nanda Devi Biosphere Reserve from time to time. The two are the representative areas of the lower Tarai Bhabar tract and high altitude areas respectively. The studies indicate the following numbers of species.

Corbett Tiger Reserve

Flora	No. of Species	Fauna	No. of Species
Higher Plants	266	Mammals	55
Lower Plants	222	Birds	526
Aquatic and Marsh herbs	25	Reptiles and Amphibians	33
Grasses	42	Fishes	29
Sedges	25		
Woody Climbers	22		
Herbaceous and sub woody climbers	25		
Epiphytes	8		
Bryophytes	20		
Mosses	8		
Lichens	20		

Nanda Devi Biosphere Reserve

Flora- 1000 species including Fungi, Lichens, Bryophytes, and Pteridophytes.

Fauna	No. of Species
Mammals	29
Birds	229
Reptiles, Amphibians and Fishes	12
Orthopods	230
Molusks	23
Anilids	6

The forests of Uttarakhand are not only vital for the environment of the State but they play important role in regulating the climate of the country. Their contribution towards the economy of vast population of Indo-Gangetic plains can not be undermined. The Himalayas are store house of water as their snow covered peaks and extensive glaciers sustain a perennial river system that not only supports irrigation and power projects but also helps in recharging the groundwater of fertile plains down below. The oak forests are known to conserve water through their massive root system. They along with other forest systems also regulate the flow of water without disturbing the fragile ecosystem of the young Himalayas. Denudation of forests leads of extensive floods in the plains. The mythological belief of Hindus that Lord Shiva's long hairs contained the merging Ganga from Himalayas gained ground only due to these factors. In a forested area only 38 kg. of soil erosion takes place annually whereas in a deforested area 138 tones of soil erosion has been estimated during one year.

With only 10% fresh water available out of the total available water on the earth, the contribution of Uttarakhand is substantial. It is said that the forests are the mother of rivers. It is most befitting for Uttarakhand. All the villages situated on hill slopes derive their water from the springs fed by the forests.

In terms of growing stock of important timber, pulpwood and other industrial wood the State has approximately over 19 crore cubic meters of growing stock in its forest mainly of Sal, Chir, Fir, Spruce, Kail, Deodar, Teak, Poplars, Sissoo, Khair and other miscellaneous species. This capital is worth 76000 crore in monetary terms. If we take increment on this capital as 1 percent per annum then these forests are capable of yielding wood worth 760 crore of rupees every year.

Apart from timber the Chir forests are yielding over one lakh quintal of resin every year which is worth 30 crore of rupees. They also produce Bamboo, Ringal, Baib grass, Thatching grasses, fodder grasses, medicinal herbs, fruits and flowers worth millions

of rupees in value. The fuel wood and fodder needs of the villages and townships are also met solely from these forests. Even building material such as sand, boulders etc. are produced from the river beds in the forests.

Out of approximately 46 lakh cattle head in the State 75% depend for grazing on the forests. Taking Rs. 50/- per day per cattle as the contribution of the forests in their fodder need, the forests provide fodder worth nearly Rs. 620 crores every year for these cattle. The high altitude pastures are favourite grazing grounds of sheeps, goats, buffalos, horses and mules. The nomadic graziers such as Gujars and sheep and goat graziers solely depend on these pastures for nearly 6 months during summer and rainy seasons. For the remaining period their dependence is on Tarai-Bhabar forests.

The ecotourism and adventure tourism potential of the forests are unlimited. Corbett alone attracts over one lac tourists annually. Mountaineering, trekking, river rafting, nature camping are other important activities which depend on forests, wildlife and natural surroundings of the State. The pilgrimage to important religious places situated in remote natural settings is also an important economic activity of the State.

It can safely be concluded that the main stake of this newly created State of Uttarakhand is going to be the forest, nature and water based activities. The natural resources of this small Himalayan State are vast and the future of this resource rich State will depend on how they are conserved for sustained utilization. A careful approach balancing the developmental needs and environmental considerations seems to be the answer.

Gender: The Missing Link in Environment Conservation

Aditi Kapoor*

Women and the Environment

There is little doubt today that natural resources - soil, water, air, flora and fauna - are indispensable to the livelihood of rural women. Women do much of the work on the land, in the forests and with the livestock and contribute substantially to household incomes. Ironically, although women are often the most affected by the widespread depletion of these resources, they have little power to do anything about it. Their voices are muted in their own households and communities. Such help, advice, communication that come from the outside too is usually directed at men.

This gender blindness is not surprisingly considering that gender and environmental issues have traditionally been dealt with separately by academicians, researchers, policy-makers and technologists. Environmental literature tracing the historic evolution of ecology has ignored women's ecological role. For instance, *The Organic Farming Source Book* (Alvares, ed 1996) details the traditions of producing and processing food in India but has nothing specific on the role of women in agriculture. While a lot has been written on bio-diversity in recent years, particularly after the United Nations Conference on Environment and Development held at Rio in 1992, women's role in bio-diversity management has continued to be neglected (MSSRF 1997). Interestingly, this has happened despite a growing concern with and much work done on people's participation in environmental regeneration and resource management. Literature on gender has also circumvented women's role in bio-diversity conservation. This includes the government's *National Perspective Plan for Women: 1988-2000* (GOI 1988a) and *Shramshakti-Report of the National Commission for Self-employed Women and Women in the Informal Sector* (GOI 1988b).

Today, though all environmentalists recognise that women possess specialised knowledge about flora, fauna and ecological processes, and agree that women's participation is necessary to tackle the environmental crisis, this has not yet informed policies or field programmes on biodiversity. Policy makers, primarily urban-based and male, are only now beginning to realise that incorporating a gender dimension in bio-diversity conservation would greatly enhance the efficacy of the programmes. Even the methodologies of 'rapid rural appraisal' and 'participatory rural appraisal' being used by international and national agencies in designing field projects have not yet adequately tuned into women's needs and aspirations. Understanding women's needs and aspiration requires time, patience, an ability to 'listen' and understand rather than just to hear, and an appreciation of the categories and language women use to describe their worldview. Even in the rare cases where 'ask the women first' dictum is followed, 'participation' is limited to consultation, planning and management while political and economic questions of women's control are ignored (Krishna 1996:118).

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Making bio-diversity management gender responsive requires listening' to women, and not just 'hearing them out.' It means recognition of and building upon women's knowledge-base, their skills and ensuring that women have control over the processes of change. For instance, government and externally-initiated community-level afforestation and conservation programmes claim to form 'new' rules which bar villagers from cutting trees for fuelwood but permit gathering of fallen leaves, twigs and branches for their use. Traditionally, women have observed these very norms while gathering firewood. Even today, 75 per cent of firewood for rural domestic use in Northern India conforms to this unwritten rule (Agarwal 1995).

Understanding and Applying the Concept of 'Gender'

'Gender-focus' in development theory and practice has come to mean 'women-focussed' or 'women-centred- rather than encompassing the complementary roles played by both the male and the female sexes in all social processes including managing the natural environment. There is thus a need to understand what 'gender' means and how it is to be construed with respect to bio-diversity conservation and management.

'Gender' is not Exclusive to Women

In any discussion on 'gender' *there is a need to keep women's interest central but not exclusive because men need to change just as much as women to accommodate women's interests.* Within households, in fact, women do not distinguish between the well-being of males and females (though in extreme forms of patriarchy women, ironically, favour the opposite sex) and do not advocate fulfilment of their needs at the cost of menfolk. A gender perspective endeavours to bring about a structural change in processes and institutions that are dominated by patriarchal interests so as to correct this skewed control. The aim is to create viable spaces for women so as to equip them with opportunities and access to economically productive resources as well as to social resources such as knowledge, power and prestige' (Saxena 1993). In other words, men's interests need to be aligned with those of women.

On the ground, both men and women are active agents in securing the material needs of a household. For instance, available literature suggests that women prefer planting of broad-leaved species which will meet their subsistence needs for fuel and fodder to men's preference for growing more commercial species like eucalyptus or teak, the timber of which is used for house construction and for making agricultural implements. However, there is not necessarily a contradiction between the two kinds of needs since both are necessary for household security. A gender sensitive approach would find a solution that satisfies both needs rather than pits one against the other by focussing only on women's needs. *For instance, subsistence and consumption needs of women can be met from forests by encouraging regeneration of shrubs and low-market value but high bio-mass plants like agave and trees such as prosopis, ber, neem, and karanji, so that women's usufruct rights enable conservation of the afforested areas (Saxena 1993). Market demand for commercial plantations would then be met from private lands. Farmers could raise multiple purpose trees to meet subsistence as well as income-*

generating needs. This would require a reversal of the government's forest and agricultural policies both of which favour men's primary interest for cash-income rather than assuring women's subsistence needs (Saxena 1993).

Studies have also found that targetting women exclusively for environment regeneration has often aroused suspicion and resentment among the men of the community and hindered implementation of the projects. This, for instance, was the experience of People's Education and Development Organisation (PEDO) in its work with women in wasteland development in Bicchiwara block of Dungarpur district, Rajasthan. The organisation found that though women could easily be inspired to become organised and develop the wasteland for fodder and fuel collection, they faced strong opposition in their own families and in society at large. Holding of joint meetings of men and women initially helped create a more non-threatening atmosphere and benefitted the project work (Sarin and Sharma 1993).

There are other interesting field examples of how men need to be involved in gender-focused' projects for successful implementation. Village women in the Bhal region along the Gulf of Cambay in Ahmedabad district, Gujarat, for instance, have secured water supply and successfully afforested saline wastelands while achieving a better status in the eyes of their menfolk and community male leaders by very tactfully involving men in their work and giving the men equal importance in the village's achievements (Barot, 1992). In the well-documented case of women successfully greening the Bankura wasteland in West Bengal, men were consciously involved both in the management of the cooperative as well as field staff. These men established a good rapport with the women leaders. Another factor which contributed to success in this case was the emphasis on imparting training and professional management skills to the women as an integral part of project implementation. More attention could, however, have been paid to training the women in the scientific and technical aspects of afforestation and in the rearing of tasar cocoons (MSSRF 1997). Value-addition and skill upgradation for women in any environmental project are as necessary as physical inputs such as good quality seeds.

Empowering Women

At another level, the 'gender-focus' in environmental policies and programmes has generally been limited to improving women's living conditions, as in ensuring access to fuel and fodder, without addressing the power relations between men and women, both within households and in communities. In other words, most policy-makers and researchers are content with addressing women's practical needs but pay little attention to questions of their empowerment, or what are termed as women's 'strategic' needs. Addressing these strategic needs helps women to achieve more self-confidence, better economic and political opportunities, a better status and role in decision-making vis-a-vis the men in the community. *While it is necessary to address women's 'practical' needs, these are only pre-conditions for women's empowerment.* This, for instance, would mean empowering women as potential leaders in conservation efforts by assuring them of long-term rights over land/water/forest and other productive resources; and by

gender sensitising the wider rural and institutional leadership to make it more responsive to women's needs and aspirations.

In the case of bio-diversity conservation in forests, for instance, information on sexual division of labour should include description of differential access to and control over resources and benefits. Customary law recognises women's right to the income from forest products collected by them and any curtailment of their daily access to essential non-timber forest products (NTFPs) could wipe out avenues of their income. Again, without land tenure or ownership rights, women are less likely to invest in long-term conservation practices. This is especially because women without such rights are excluded from the decision-making sphere where (male) land owners, and those with ownership rights on forest produce, take decisions which affect women's work on these lands (see, for instance, the Panchmahals example below). Also, access to other productive resources is often linked to ownership of, or rights to, land. For instance, access to credit often requires land as collateral. On forest lands too, if women have no assurance that they would have long-term rights to harvest what they plant today, they may not be willing to put in much effort in conservation. At another level, ownership and control of property contributes immensely to women's economic well-being, social status and empowerment (Agarwal 1994), thereby increasing their efficiency in implementing conservation programmes.

In the Panchmahals district of Gujarat, for instance, women own little land or property and so decision-making concerning land is almost an exclusive preserve of men. Women have found it difficult to break this barrier. It has been impossible for women to undertake environmental regeneration and bio-diversity conservation on private lands. They have directed their energies to common lands though there is an acute scarcity of common lands. Yet, despite a "no objection certificate" and panchayat resolutions supporting their right to work on the land and use its usufruct, the legal validity of this arrangement is uncertain. The biggest problem the women groups face is how to legally secure their rights to the produce of the land they are developing with so much effort (Sarin and Khanna, 1993). This would require legal literacy, effective political voice on decision-making bodies at various levels and productive campaigns. All these are possible when *women's strategic needs are integrated into 'women-focused' environmental projects from the very beginning. Any discussion or planning on gender and bio-diversity conservation is incomplete without recognising the power balance between men and women. Yet the majority of interventions, at both policy-and field-level, ignore this reality.*

Gender: Not a Homogenous Category

A third way in which 'gender' is often conceptualised is to exclude all other factors, such as caste, class, age, religion and ethnicity which divide society and which influence development processes. In reality, however, *'gender' is not a homogeneous category and policy interventions need to take into account economic and socio-cultural realities of different communities.* This way of looking at 'gender' is largely due to the initial advocacy done by eco-feminists who hold that 'nature is the embodiment of the feminine principle' and identify women with nature, and men's exploitation of nature with men's exploitation

of women (Shiva 1988). Women are seen to be just like nature', caring, nurturing, sharing and life-giving. This ideology, however, ignores the fact that socially ascribed gender relations are neither universal nor static but vary across, and within, cultures, time and space.

Gender roles are influenced by economic, political and environmental factors. 'The link between women and the environment lies in the interactive effects of ideology and material conditions, rather than being rooted mainly in ideology or women's biology' (Agarwal 1995). For instance, upper class, urban-based women, can be as exploitative of natural resources as the men. It is also well known that women's economic roles are determined by caste, class and religion. The worst victims of the environmental crisis and those who are bereft of control over resources are mainly women dalits, tribal women and lower caste women. Looking across cultures, though hunting is accepted as a male preserve, Sumi Krishna's study in Mizoram has revealed that in the Mesolithic period women participated in hunts and even today both men and women have knowledge about animal ecology. Similarly, ploughing is generally men's work but women in the Kolli Hills in Rajaji Namakkal district, Tamil Nadu, also use the plough (MSSRF 1997). In communities where gathering is the major contributor to the households, men's share in gathering is substantial (Krishna 1996: 114)

Women: Oriented to Subsistence

Another aspect of a gender perspective on environment deals with the subsistence oriented use of natural resources as against their commercial exploitation. In the patriarchal, industrial mode of development, a primary objective of conserving bio-diversity is to exploit these resource commercially rather than to fulfill the sustenance needs of households. Experience has proven that most rural women tend to have a greater interest in preserving and conserving cropland, forests and other natural resources for perpetual use while men are more often concerned with converting these resources into cash (MSSRF 1997). In the mid-1080s, for instance, tribals from a number of villages mobilised themselves to protect their devastated forests in the Santrampur taluka of Panchmahal district, Gujarat. The men, however, had identified regeneration of teak, used for timber in house construction and for making agricultural implements, as the primary objective rather than regeneration of firewood and green fodder (Sarin 1995). *Policy interventions designed from women's perspective are likely to lead to more sustainable bio-diversity conservation than interventions framed by men which are directed more towards conserving commercial species.*

Women's Ecological and Economic Roles: Myths and Realities

The main reason for the divorce between gender and environment can perhaps be traced to the dominant patriarchal interests which govern the household, the community and the State and which have failed to provide viable spaces for women. So, though rural women have been primarily responsible for gathering, processing and producing food for the household, they are considered to be 'just' housewives, confined to household chores. Consequently, they are considered economically unproductive and thereby

ignored. Further, all house-holds are believed to be male-headed and it is taken for granted that men take care of women's material and economic interests. It is also generally accepted that women are not able to think, plan or act on their own; are not able to identify their problem areas and propose solutions; are shy of participating in public affairs; and so do not want to take on decision-making roles.

In reality, about 84 per cent of all economically active women in India are engaged in agriculture and allied activities like livestock, forestry and fisheries, compared to 63 per cent of all economically active men (GOI. 1995). Of the women workers, majority are cultivators or work on the fields as agricultural labour. The rest are engaged in livestock, forestry and fisheries. In economic terms, agriculture contributes over 30 per cent of the GNP and accounts for 60 per cent of employment. *Women's substantial contribution to agriculture, as well as to food processing and marketing, should entitle them to benefits from major state-sponsored programmes by providing access to productive resources such as land and credit. Women's participation in agricultural extension, training and research also needs to be expanded.* Women extension workers constitute a mere 0.59 per cent of farm extension workers (GOI 1995). Interaction between women farmers and male extension agents is severely restricted due to social norms. As a result, exchange and up-gradation of skills and access to appropriate inputs gets neglected. Among forest communities, women and girl children are the main gatherers of forest produce for subsistence and sale. They are also wage-employees of the State Forest Departments (and the Forest Department's private contractors) since the nationalisation of the NTFPs. According to the World Bank 1991 report, *Gender and Poverty in India*, women constituted the majority of workers engaged in the NTFPs economy (Sarin 1994). *There is an urgent need for initiating official surveys on the number of women thus employed by the Forest Departments for gathering NTFPs, the wages they earn compared to the price the products fetch in the market, the time the women spend in gathering this produce and the substantial revenues earned by these departments.* Two of the main cash earners among NTFPs, sal seeds and tendu leaves, are collected primarily by women (Sarin 1994).

Catering to women's needs and including them in the plans and programmes for environmental management and regeneration is necessary also because almost 30-35 per cent of rural households are estimated to be headed by women. These households are dependent almost exclusively on their income, in cash and in kind. Even where there is a male earner, women's earnings contribute in a major way to the household's survival (GOI 1995). Women's contribution to cash income of the household is higher in villages close to forests than in commercialised villages (Chambers et al 1989). The collection of NTFPs such as essential oils, sal seeds, tendu leaves, gums and resins, tans and dyes, lac, tasar and tamarind is a good source of cash income for women because of the increasing commercial value of NTFPs.

The well-known Chipko movement of 1973, when the Garhwal hill women hugged trees to prevent them from being axed revealed the strength of women in the public sphere. Subsequent studies on protection of common lands have proved that women and

communities are more effective at protecting and regenerating degraded lands and forests than either the state or private landowners (MSSRF 1997). The more successful community-level Joint Forest Management initiatives in West Bengal and elsewhere have demonstrated how women can gain both materially as well as in status if they play an effective role in local-level forest protection committees.

Women in Bio-diversity Projects

Government bio-diversity conservation projects have not only been consistently gender-blind but also promoted policies which have been detrimental to women's interests and are resulting in erosion of their knowledge about bio-diversity. Benefits from the government's social forestry programmes, for instance, were cornered by the better-off farmers rather than by smaller farmers and the land-less (Chen 1993). Almost 50 per cent of rural female workers are classified as land-less labourers and this proportion is rising. Social forestry also promoted timber species rather than those which gave women fuelwood and fodder (Chan 1993, Saxena 1993). *Gender-sensitive policies which favour planting of usufruct-based trees such as neem, mahua, tendu, sal, arjun and tamarind, which benefit women, rather than species such as teak, eucalytus and pines, are called for. Such social forestry projects should then be extended to reserved and protected forest lands (Saxena 1993).*

Nationalisation of NTFPs appropriated women's customary rights over forest produce and exposed women gatherers to increased harassment at the hands of forest officials and private contractors. This reduced their collection and income (Saxena 1993). *Gender-sensitive policies require restoration of customary rights and a more open system of marketing NTFPs where women are able to control factors such as value-addition and pricing.* Modern technology is often cited to be gender-biased because it caters to men's needs. For instance, in the case of *sal* trees, a common source of income for poor women gatherers, the modern technology of multiple shoot cutting pushes the leaves out of reach of women (MSSRF 1997).

Joint Forest Management programmes, operating in about 17 states, have been criticised primarily for two reasons: for not providing for women's representation on the joint committees, and for promoting planting of timber producing rather than usufruct species and thereby barring women's access to the protected forests. This has increased the time spent by them in accessing fodder, fuel-wood or its alternatives, and other NTFPs (Sarin 1995). Women face shortage of fuelwood, fodder and earnings from other NTFPs where forests are degraded. *JFM policies need to encourage active participation of women in the committees, and to provide for alternative forms of fuel and income-generation activities.*

Women's Bio-diversity Knowledge Under Threat

Natural resource depletion and dwindling bio-diversity is eroding women's elaborate knowledge about seed varieties, forest herbs and other plant species; and their time-tested technologies for the processing and preservation of these products. Modern technologies like irrigation and high-yielding seed varieties have reduced area under

traditional crops and methods of seed selection and preservation (MSSRF 1997). Displacement of agricultural and forest communities in the wake of mega dams, setting up of industries and other 'development' projects have taken women away from their natural resource and knowledge base. Agricultural policies encouraging cash crops with no incentives available for cultivating traditional varieties, and promoting consumption of just a few cereals, mainly rice and wheat, through the Public Distribution System, have led to erosion of women's knowledge of diverse plant species.

The Global Environment Facility-funded Eco-development plans for bio-diversity conservation in selected National Parks and Sanctuaries too are not gender sensitive. Though women are to be involved in the implementation of the programmes, there is no proposal to revive and protect women's customary rights over land/water/forests nor do the plans recognise local traditional knowledge (Kothari 1997). Much of the knowledge of bio-diversity and of indigenous bio-technologies, including indigenous herbal systems of medicine, rests with women. Any involvement of *mahila mandals* in the eco-development strategies will be cosmetic unless *programmes are re-defined from a women's perspective and their knowledge is preserved and enhanced. Women with a little training, can function as taxonomists or be responsible for preparing and maintaining community bio-diversity registers.*

Even environment regeneration projects such as afforestation, wastelands development, water harvesting systems, and Joint Forest Management have either ignored the gender dimension or focused on women in an extremely limited fashion. Even in the more successful women-focused initiatives, women's role as experts on bio-diversity has not been explicitly recognised and, therefore, not built upon (Datar, 1998; Proffenberger and McGean, eds, 1996; Singh and Ballabh, eds, 1996; Singh and Burra, eds, 1993). *Policy interventions need to integrate bio-diversity conservation in all environmental programmes with due focus on the recognition, documentation and up-gradation of women's knowledge about bio-diversity.*

Of special concern are fisher-women whose livelihood and knowledge is threatened by rapidly flourishing mechanised fishing and aqua-culture. Though India's 7500 km long coastline and the many rivers support numerous fishing communities, conservation of marine bio-diversity continues to be low on national priority. The strong movement among the local fisher-folk to safeguard their own livelihoods has made policy makers sit up. However, ecological concerns, local knowledge about fish diversity and other marine flora and fauna have not yet become part of these campaigns. With diminishing fish stock and expanding industrialisation of marine activity, women are increasingly being employed as wage-labour. However, though the work performed by the women is the critical task that enhances the value of the product, the women do not even receive minimum wages and are at the bottom of the ladder in terms of status (Joseph and Prasad, eds 1995).

In the inland fishery sector, contracts to fisher-men's societies and fisher-men's development agencies are displacing women from their traditional rights over the small catch and in the processing operations. Fishing contracts in ponds and tanks in small towns and villages are also affecting the common resource base of the fisher-women

(Kurien 1996). Women, involved in all processes after the fish catch comes in, are not only knowledgeable about the various species but are also skilled in value-addition including processing, drying, curing and even net making. The market, however, is primarily male dominated. *Policy interventions are needed to safeguard women's customary rights over the small catch and to strengthen the forward linkages so that women can organise themselves and effectively market their produce. At another level there is a need to integrate their knowledge with the remote sensing global imagery of marine bio-mass. With their remarkable knowledge, women can benefit the marine industry as experts on marine diversity (Kurien 1996).*

Lessons from NGO Experiences

While government-initiated bio-diversity projects have been gender blind, a few NGO-initiated programmes have some lessons on how conservation strategies can be made more gender sensitive and how women can play a more effective role in bio-diversity conservation.

Social Action with Rural and Tribal Inhabitants of India (SARTHI) has *integrated community women's knowledge about medicinal herbs, plants and nutritionally important trees into the wastelands development programme involving women's groups* in the Santrampur block of Panchmahals district, Gujarat. Significantly, however, the recording of women's local knowledge of medically useful flora was not part of the original project design. The need for such a step came to the fore at a training programme conducted by SARTHI for *dais* (midwives, both traditional and modern) in response to the women's demand for access to improved health services (Sarin and Khanna 1993). The inherent link between health, nutrition and environmental degradation is obvious from a gender perspective of bio-diversity management. Recognition of these links not only ensures bio-diversity management, but also enables fulfillment of women's practical and strategic needs as was proved in the SARTHI's programme. While the forests of Santrampur block became rich in medicinal herbs and plants, the local women and children's health and nutritional problems were met and, most importantly, trained cadres of village women skilled in health care and para-veterinary emerged.

Women of the Aravali's in Rajasthan have similarly integrated revival of traditional water harvesting system with bio-diversity conservation leading to their empowerment. Catalysed by a local NGO, Tarun Bharat Sangh, village women from Gopalpura, Gujjaron Ki Losal, Bhanvata-Kolyala and Hamirpur in Alwar district, have come out from their isolated, veiled existences into the open-joining hands with their menfolk in building *johads*, the old water harvesting check-dams. These have led to regeneration of the forest cover in the villages. They have organised themselves into informal women *Gram Sabhas*, undertaken employment generation activities such as weaving of baskets from the indigenous varieties of 'Champurua' grass replenished in abundance in the village forests and *revitalised the Ayurvedic health system by regenerating many indigenous species of roots and herbs. Women are serving as Ayurvedic doctors in their own villages (GPF & FAO 1998).*

Women Conservers - Forging Forward and Backward Linkages

Women perform much of the harvesting, seed selection, sowing, storage and other processes which conserve and enhance crop diversity (Kothari 1997). This is reflected in Navdanya, a national *in-situ* genetic resources conservation initiative which networks community-based genetic resources conservation centres at the grassroots. The programme was started by a New Delhi-based NGO, the Research Foundation for Science, Technology and Natural Resource Policy. The farmers associated with Navdanya are mainly marginal farmers and peasants in so-called 'backward' but resource-rich areas of the Garhwal Himalayas and the Western Ghats, and some drought-prone areas in Karnataka. Here the green revolution has either not made a dent or has not delivered its promises because of its capital-intensive nature. In many cases, these marginal farmers are women for whom the use of traditional seed means the difference between survival and non-survival (Shiva, et al 1995). Women in the more ecologically devastated areas, particularly in the Himalayas, have been primarily responsible for agriculture because of the extensive out-migration of adult males to the plains and larger cities in search of livelihood. This process has been termed 'feminisation' of agriculture. Conserving agricultural diversity for these women not only secures food for their families but also enlarges their options for meeting their non-food bio-mass-based needs such as fodder, fuel, thatch for the house and raw material for marketable crafts.

'Navdanya places the farmer at the centre of conservation, [and] relocates in her/him control over the political, ecological and economic aspects of agriculture' (Shiva, et al 1995). While the dominant system of agriculture does not recognise farmers' contribution to breeding and therefore awards breeders' rights only to the seed industry or to researchers, in the partnership model promoted by Navdanya, farmers and scientists are equal partners. Further, seed conservers need markets which they can control. Navdanya strengthens farmer-to-farmer, farmer-to-scientist and farmer-to-consumer linkages. This is a model which policy makers can adopt. However, while Navdanya inherently gives due importance to women farmers, national policies and programmes modelled on the Navdanya experience will need to include special measures to be gender focused. *Community-level programmes should be designed in collaboration with women seed producers; conservers and processors and women's groups should play a central role in the implementation of programmes.*

Further, policies will need to ensure gender sensitisation of the various stake holders, including male and female extension workers. Extension workers, men and women, cannot successfully cater to women workers unless they are trained in motivational and conflict resolution skills needed to galvanise workers into action and break social barriers in a patriarchal society. Gender-sensitisation of the scientific community would include building upon traditional practices rather than transplanting laboratory experiments to the field. Gender sensitising the district and state bureaucracy would mean creating an environment where women can seek information fearlessly and negotiate as equals. To make markets more women-responsive, policies need to encourage setting up of appropriate inter-linkages such as cooperatives, self-help credit groups, grain banks,

local-level societies in order to bypass middlemen and/or help in processing, marketing and branding of farm-based products.

Also, like Navdanya, policies and externally-initiated programmes should act as catalysts to facilitate women conservers and natural resource managers to build up their capacities so that ultimately they manage to control the political, ecological and economic aspects of conservation. *"In situ* conservation is first and foremost a political commitment and cannot be sustained through subsidies and external support alone" (Shiva, et al 1995). The national government's endeavour to devolve political and economic powers to the local Panchayats is also a step in this direction. Just as the Panchayati Raj's success or failure depends on the decentralisation power of the policies which govern it, *women's strengths in conservation can be augmented, and benefitted from, if the bio-diversity and agricultural policies involve as well as empower them. This requires a political recognition of women in their own right.*

Women and Medicinal Plants

Another successful gender-sensitive bio-diversity conservation effort that has lessons for public policy is being coordinated by the Bangalore-based NGO, Foundation for Revitalization of Local Health Tradition (FRLHT). The project aims at conserving and sustainably using medicinal plants for Primary Health Centres (PHCs). The project has set up a network of over 55 medicinal plant conservation sites in Kerala, Karnataka and Tamil Nadu in collaboration with State Forest Departments, local NGOs and research institutes. The foundation recognises that women are perhaps the biggest single group to possess knowledge about home remedies from medicinal plants. This knowledge is mainly inherited by daughters and is thus preserved over generation. Women's groups are one of the village-level organisations targetted by the Foundation for conservation and use of medicinal plants. Women are trained in growing medicinal plants extracts of which are used in PHCs. These plants are grown in kitchen gardens by the women since women have direct access to, and control over, this patch of land. Kitchen gardens have multiplied through self-help training groups and 377 women's groups had set up 5162 kitchen herbal gardens till March 1998. Some women's groups are also growing medicinal plants on marginal lands and field bunds.

The Foundation has also set up Medicinal Plant Conservation Parks where women grow herbal plants. These Parks also act as a market intermediary by selling medicinal plants seedlings to women and purchasing medicinal plants grown in kitchen gardens. These plants are then sold by the Parks to various user groups. Self-help training groups also use the medicinal plants nurseries attached to these Parks.

While the Foundation has emphasised women's involvement in conserving medicinal plants, policies based on this model need to go beyond by enabling women to emerge as leaders in this area. Capacity enhancement based on local skills and knowledge should form a necessary part of environmental and agricultural policies relating to medicinal flora and bio-diversity. This would mean *policies and programmes empowering women to become doctors, teachers, trainers, researchers and policy makers in the area of medicinal plants both in traditional medicine and in modern medicine. Further,*

women should not be limited to kitchen gardens but given access to, and rights over, revenue or forest land for growing herbs and empowered to establish forward linkages with markets. For instance, Gram Panchayats in Himachal Pradesh had the powers to levy collection fees for harvesting medicinal plants till as late as 1971 when it was constituted as a full state (Gadgil 1998).

According to the Foundation, the utilisation of medicinal plants is already very sophisticated in India. In its original form and with some technical enhancements, the tribal, ayurvedic and other indigenous health systems could provide the world with medicine rather than raw plant material (Kothari 1997) which is currently being exported, both legally and illegally. Modern medicine too is heavily dependent on medicinal plants available in India as is indicated by the keen interest shown by several leading pharmaceutical multinationals, such as Cargil Inc., Unilever, Hoechst, Sandoz and Ciba-Geigy, in Indian germplasm. Transnational companies are setting up ventures, often in collaboration with Indian partners, for prospecting and for drug or seed production. Rural Advancement Foundation International (RAFI) has estimated that pharmaceutical corporations cut their costs of screening a new plant for genetic properties by 50 to 90 per cent if they have access to traditional knowledge about the plant (Kothari 1997). Home gardens are often used by women to grow diverse wild and indigenous species. Policy makers can indeed capitalise on rural women's specialised knowledge in this sector with appropriate interventions that empower these women to challenge global powers.

Valuing Women's Knowledge

Even as a beginning has been made to record the rich bio-diversity of the country, due consideration should be given to women's knowledge in the various Community Bio-diversity Registers under preparation. *Recording of names of the women seed conservers and seed producers, women's knowledge about the various forest species of flora and fauna, their utilization and the value-addition technologies used are all necessary to make women more visible in bio-diversity policies and programmes.* Giving due importance to women as bio-diversity experts is not going to be easy in a patriarchal society. *Policy interventions need to encourage collection of gender desegregated data, and develop systems of rewards and social recognition for bio-diversity conservation efforts where women have been active participants.* These interventions would not only preserve and rejuvenate ecological diversity but also contribute to the enhancement of the economic and social status of rural women.

The ongoing People's Bio-diversity Registers (PBRs) Project (Gadgil 1998) is a step in the right direction but unless women's knowledge is scrupulously included, these data collections may become another tool in the hands of those who want to appropriate women's traditional knowledge and deny them benefits resulting from these. *The PBRs should be prepared in a participatory manner and should be open documents easily accessible by the public (Gadgil 1998).* For instance, they could be put up in public places. If such transparency is maintained, women would benefit from it. A PBR both documents the status of local bio-diversity resources as well as records local knowledge

of these resources. Where women are primarily responsible for collecting bio-mass, they often have greater knowledge of the status of such resources. Women in many parts of Himachal Pradesh have extensive knowledge about this and women groups have been at the forefront of many local conservation initiatives; in the Chuhar valley of Mandi they are protecting forests not only from timber smugglers but even from their own men (Gadgil 1998).

In the wake of the Intellectual Property Rights emanating from the World Trade Organisation/General Agreement in Tariffs and Trade, bio-diversity registers would facilitate sharing of benefits with the actual producers and innovators of biological diversity. These would be used as evidence of people's knowledge of the various uses of bio-diversity resources including as therapeutics, cosmetics, and as pesticides (Gadgil 1998). *For this, a national community register would have to be built based on the community registers* so that the government can deal with the property regimes now threatening traditional owners of bio-diversity knowledge. The privatisation of bio-diversity can also be countered if *state policies facilitate networking among communities with regard to these registers*. Such efforts would also have to be coordinated amongst people's organisations across the developing countries to become a countervailing force to the IPR regime (Shiva et al 1995).

There is an urgent need to *develop effective benefit sharing mechanisms which give due consideration to women bio-diversity experts in the community. Policy interventions need to design programmes which would empower women to express, own and control bio-diversity knowledge*. This is easier said than done because access to the patent regime requires awareness, information, legal knowledge and ability to bear the cost of access. Rural women experts are illiterate and bereft of these 'modern' resources. Policy interventions should aim at *encouraging involvement of catalyst agencies such as NGOs and promoting education and empowerment of women* not only to benefit from the IPR regime but to make women's role in bio-diversity conservation more effective.

Further, no models exist yet for equitably sharing the benefits of traditional knowledge between communities and the institutions or agencies which profit from the traditional knowledge of these communities. It is also not clear to *whom* the benefits should go - individuals, families, community-leaders, representative NGOs or government agencies? (Kothari 1997). Further, it might not be always possible to determine what traditional knowledge is 'private' from that held in common by the community. However, *policies regarding target beneficiaries have to explicitly consider the stake of women in this debate*.

The unique model developed by the Thiruvanthapuram-based Tropical Botanic Garden and Research Institute (TBGRI), for instance, is still not clear on how the benefit will actually flow to the tribals whose knowledge of a forest herb, *Trichopus zeylanicus*, has resulted in the development of a drug called *jeevni* TBGRI developed the drug based on the properties of the herb used by the Kani tribe as anti-fatigue and restorative medicine and transferred the technology to a private ayurvedic company in Coimbatore. TBGRI is to transfer 50% of the license fee and 3% of the royalties to the state Tribal Welfare Department to be used for the Kanis. Whether the funds will flow to the Kanis or not is

one question. Another is the fact that nowhere do gender concerns figure-neither in the information flowing from the tribe to the TBGRI; nor in the benefit sharing model agreed upon. *Policy interventions on benefit sharing models need to incorporate gender-sensitive clauses.*

Women and Gene Banks

Examples of informal *ex situ* conservation by women, who preserve seeds to be grown in home gardens or in fields, already exist. However, access by rural women to government-owned gene banks is problematic; just as most rural women have lacked access to credit, education and other productive and empowering resources. *Policy interventions need to promote information campaigns and decentralise delivery mechanisms for accessing gene material.*

Women often have 'scientific' knowledge about genes and cross-fertilisation, only this is expressed in a language different from that used in modern science. Women's knowledge and innovations also reflect real-life situations and the scientific community would benefit interacting with such women experts. *Informal ex situ knowledge should form the basis of ex situ data banks and women can be encouraged to re-establish in situ conservation. For this, the male-dominated scientific community needs to be gender-sensitised.*

Legal Provisions to Support Women

Women's role in both *ex situ* and *in situ* conservation would be enhanced if gender concerns are incorporated in laws governing bio-diversity. Unfortunately, the drafts of the two key Acts announced by the government are not gender sensitive though women will be radically affected by the provisions of the Acts. The draft Biological Diversity Act, 1998, proposed by the Ministry of Environment and Forests, and the draft Plant Variety Protection and Farmers' Rights Act proposed by the Ministry of Agriculture, for instance, do not provide for *gender-specific databases and information systems or for gender-oriented participatory research, or for gender-monitoring of related policies (such as policies on the IPRs) and project plans.*

The Acts also adopt the conventional 'top-down' approach. This is ironical since the Acts aim at protecting traditional knowledge and farmers' rights. Yet, the holders of such knowledge and the seed conservers are inadequately represented in the decision-making structures set up by the Acts which do not require *setting up of structures at the district and village levels to decentralise decision-making powers while resting the final authority in the national-level apex body.*

Each of the draft Acts propose to set up an apex National Authority, comprising mainly bureaucrats and technocrats, for enforcement and implementation of the provisions of the Acts, but do not ensure gender parity in these bodies. Suggestions have been made to give gender representation 'due regard' or include a representative of the National Commission for Women (MSSRF 1997) in the Authorities. However, rather than the vague 'due regard' or inclusion of a representative from the NCW, which does not specialise in environmental issues, it would be worthwhile *to reserve at least one-third*

of the seats for bio-diversity experts from gender-oriented institutions/organisations. Similar provisos should govern state-level and other parallel bodies. Besides, it should be mandatory for inclusion of at least two experts on women and bio-diversity in the various committees to be set up by the apex bodies.

The Bio-diversity Act provides for the funds to be utilised for 'socio-economic development' of the conservers of biological resources in areas from which these resources, and/or knowledge thereof, have been accessed for the purposes of IPRs. The Gane Fund is proposed to be used for recognising, rewarding and supporting farmer-conservors of genetic resources. *The proposed National and State-level Bio-diversity and Gene Funds in the respective Acts should include a clause ensuring that benefits reach deserving women in the communities benefiting from the funds. The Acts should also explicitly incorporate gender concerns in the guidelines relating to 'equitable' benefit sharing and protection of farmers' rights.*

To safeguard the rights of traditional knowledge holders and farmers' rights, the provisions regarding appeals against decisions taken by the Authorities in the Acts *should provide for public hearings at the state, district and village-levels to enable women easier access.*

Women's Representation in Decision-making Structures

Given the extensive and proactive role that women play in natural resource management, *there is an urgent need to set up gender sensitive institutional frameworks and include more women in decision-making structures; particularly those relating to agriculture, forestry and science. A sex desegregated data of existing institutions is also necessary.* While more girls than boys opt for life sciences at the university level, in bio-diversity research institutions their number is negligible (MSSRF 1997). Further, few women occupy senior positions in scientific research institutions, or undertake field explorations. In the National Academy of Agricultural Sciences, for instance, less than 3% of the 225 elected Fellows, skilled in plant breeding, genetics, soil conservation and other specialities, are women and most of them are either from the social sciences or are nutritionists (MSSRF 1997). The Indian Forest Service, opened to women as late as in 1980, too has few women. In the last decade, about 4 to 5 women joined each year and in 1995 less than 3% of the total cadre strength of 2,576 were women; and women constituted less than 1% of the rangers and foresters. (MOEF 1995, MOEF 1996). Women are hardly represented in the Botanical and Zoological Surveys of India. Nor are they visible in institutions such as the National Bureaus of plant, animal and fish genetic resources, the national gene banks, the Forest Survey of India and Wildlife Institute of India.

Correcting this gender-bias in professional and scientific institutions needs a special drive to recruit women and generating awareness programmes in collaboration with educational institutions. More important, a change in the terms and conditions of these jobs is needed to make them more gender sensitive. For instance, transferable jobs are inconvenient for women as are postings to relatively inaccessible or 'unsafe' areas. At the field level, allocating areas to individual field workers like extension workers or forest rangers are impractical for women who would prefer to work in groups. Thus, instead of allocating so many villages, or hectares of protected forest to individual women workers, the same can be the responsibility of two or more staffers. Touring in pairs is

better than touring alone where women are concerned. Experience has shown that women are most effective when working as a collective, drawing comfort, inspiration and strength from each other rather than working alone in conservation projects.

The current management systems of these institutions need to be made more women-sensitive through gender sensitisation of the male decision-makers and workers, modification of working conditions too, for instance, include flexible working hours, home-based assignments, provision of creche and other support facilities for women officers and workers.

A More Gender-Sensitive Development Model

Ultimately, institutions need to work within a more gender-responsive macro environment governed by an alternative mode of development which accords more importance to sustainability and equity. Current efforts are aimed at trying to 'fit' or 'mainstream' women in the dominant consumption-led economic growth pattern with the hope that the fruits will trickle down to the rural women. Poverty alleviation schemes, 'co-option' of NGOs to improve delivery mechanisms of goods and services, promotion of labour-saving devices to 'lighten' domestic work and earmarking some positions for women in certain decision-making institutions will not deliver justice to women.

An alternative strategy, more suited to concerns of women, would, for instance, take into account the yawning gap between the rich and the poor and between men and women, not only in terms of income but with regard to other productive economic resources including land. This gap would be measured in terms of food security, access to health, nutritional status, educational and intellectual stimuli and the relative competence of men and women in achieving greater control over their lives.

Gadgil and Guha see a ray of hope in the path that the environmental debate is taking in India (Gadgil and Guha, 1992). While the dominant Western mode of development favours conservation of forests not because they are central to economic production but for enhancing 'quality of life'. In India, forests are linked to production systems and though there is a conflict in the claims of the agrarian and the industrial sector over the natural resources, alternative means of managing natural resource management are, fortunately, part of this debate. Though Gadgil and Guha make no mention of women's ecological role in this debate, there is little doubt that without a gender perspective guiding conservation programmes, the very survival of society will be at stake.

Conclusion: Giving Women their Due

Despite the present patriarchal set up, there is a growing belief that greater involvement of women is essential in dealing with the ecological crisis. Increasingly, government officials, funding agencies and NGOs are realising that conservation programmes which involved women have been far more successful than those where women had no role to play. This process of involving women, however, needs to be taken further by viewing women as more than mere 'beneficiaries' of conservation programmes. Rarely are women asked what they think. Incorporating a gender dimension in conservation programmes means learning how to 'listen' to them, not just by hearing them out but by

understanding the categories and language women use to express their perceptions. Women have to be involved in the entire process of designing and implementation of the conservation programmes.

A critical aspect of women-centred conservation policies and programmes is how 'gender' is understood. Experience has proven that though gender-sensitive policies and programmes keep women's needs and desires central, they should also focus on enhancing the role men play in supporting women-focussed conservation programmes. Indeed, 'gender' encompasses men as well as women and both have complementary roles to play in all social processes including in managing the natural environment. At another level, gender-responsive policies and programmes usually cater only to women's 'practical' needs for water, food, fodder and other material goods and services; these policies and programmes should give equal attention to addressing women's 'strategic' needs for empowerment through education, improved health, skill up-gradation and recognition of their ability and talent.

Gender sensitive policies imply a subsistence orientation as against commercial exploitation of natural resources which is dominant in the current male-dominated, industrial mode of development. Policies should also go beyond the distorted belief that women are confined to household chores and are economically unproductive, incapable of pro-active participation and unable to take on decision-making roles.

Government's agricultural and conservation policies, such as the green revolution, promotion of cash crops, social forestry, joint forest management and nationalisation of NTFPs, have not only been gender blind but worked against the interests of women by promoting crops, trees and market conditions which do not fulfil women's needs and upon which they have no control. These policies have contributed to rapid depletion of bio-diversity and, correspondingly, threatened women's traditional knowledge related to flora and fauna.

On the other hand, several ongoing efforts initiated by NGOs such as Social Action with Rural and Tribal Inhabitants of India (SARTHI), Navdanya and the Foundation for Revitalisation of Local Health Traditions (FRLHT) provide viable models for involving women in bio-diversity conservation. Government policies and programmes can fruitfully learn from these efforts. There is also an urgent need to compile a gender-sensitive bio-diversity database and develop gender sensitive policies on benefit-sharing in the wake of the Intellectual Property Rights regime of the World Trade Organisation.

Another set of challenges is to bring about structural changes in the patriarchal set up, to introduce gender sensitive laws, to include more women in decision-making bodies and to transform notions about the actual division of work and resources between men and women. These structural, attitudinal and policy changes are necessary in the long run to ensure a more equitable and sustainable future. For instance, even after 15 years since entry into Indian Forest Service was allowed to women, they comprised less than three per cent of the total cadre strength in 1995. Women are barely visible in institutions such as the Botanical and Zoological Surveys of India or the National Bureaus of plants, animal and fish genetic resources. Women are hardly represented even in the agricultural and scientific institutions such as the Indian Council for Agricultural Research. Ironically,

many rural women have immense knowledge about wild food plants, medicinal plants, seed selection and conservation, food processing, soil conservation and water harvesting systems, to name just a few 'expert' areas.

Policy Suggestions and Roles of Different Agencies and Actors

What roles do different agencies and actors need to play to ensure that women participate equally in the selection, implementation and control of environmental policies and programmes, and particularly in bio-diversity conservation? The gender-blindness of existing plans, policies and programmes as well as lessons and suggestions arising out of some positive experiences have been discussed at length above. Policy suggestions relating to various aspects of gender and environment have been italicised in the text. A summary of these suggestions is given below specifying the roles of different agencies and actors.

Role of the Government

Preparing national-level and ecological zone specific gender desegregated database on bio--diversity based on community bio-diversity inventories

Integrating gender analysis and gender monitoring into project plans from the very beginning.

Making environmental laws and intellectual property rights laws gender-sensitive.

Introducing the gender dimension in models of benefit sharing with regard to IPRs.

Enabling women to own cropland/forest land on a long-term basis through leases or other kinds of contracts.

Adhering to women's customary rights over land/ forests/ water bodies where they still exist and re-establishing these rights where needed.

Giving adequate representation to women in decision-making bodies and in administrative structures.

Undertaking gender sensitisation of decision making bodies at all levels through adequate representation of women, training programmes for men and women and modification of working conditions.

Using the institution of Panchayati Raj for gender sensitive environmental programmes.

Recruiting more women extension workers in natural resource management and equipping men and women workers with the skills required to motivate, inform and involve rural women in environmental regeneration and preservation programmes.

Encouraging participation of women and ensuring success of environmental programmes through provision of credit, training, technology and a fair market to the women and by making and project design flexible enough to accommodate field-level innovations.

Giving incentives, rewards and recognition to women who conserve agrobiodiversity, bio-diversity, traditional knowledge on genetic enhancement and revitalise conservation traditions.

Building partnerships with NGOs who work with women and the environment and facilitating networking of these and of gender-responsive community people's groups.

Encouraging direct participation of traditional, community-level institutions particularly women's groups like *mahila mandals*, in planning and implementing gender sensitive

environmental conservation programmes.

Making education for girls and women part of environmental programmes in partnership with NGOs where necessary.

Role of NGOs/Local Groups

Facilitating preparation of gender desegregated community bio-diversity databases.

Working with women's groups and towards training and capacity building of women in environmental programmes to equip them for leadership roles and as agents of change.

Gender-sensitising and strengthening community-level organisations and local institutions, including the Panchayati Raj bodies, engaged in environmental programmes.

Facilitating revitalisation of conservation traditions

Empowering women in dealing with issues such as 'prior informed consent' with regard to transferring local genetic material and traditional knowledge under the IPRs regime.

Informing women of their legal rights and using the modern information technology for exchange of information and for networking.

Facilitating networking of women's groups working on conservation.

Forging linkages between the various actors such as the government, research institutions and the marketplace to ensure women's effective participation in environmental regeneration and preservation.

Monitoring environmental programmes with questions such as 'who gains what and who loses what?' in terms of the satisfaction of women's practical needs for bio-mass and strategic needs for empowerment.

Role of Academic and Scientific Research Institutions

Undertaking research on the extent of women's contribution to bio-diversity management and the effects of modern processes like education, rural-urban migration and changing market conditions on their roles in natural resource management.

Developing parameters, models and analytical tools for gender analysis of policies and programmes.

Promoting research on women-friendly and environmentally benign crop varieties, farming and forestry technologies by involving women in the design of research programmes.

Enhancing women's role as decision-makers, technologists, scientists and field-level workers.

Building upon field-level knowledge and technologies used by women rather than relying on laboratory-to-field applications.

Decentralisation of research centres to include empowered participation of community-level leaders in 'traditional' sciences.

Assisting in training, the leaning fro, field-level agriculturists, fisher-women, forest-women.

Funding promising traditional practices for regenerating genetic varieties and preservation/processing techniques used by women on the farms, in coastal areas and in forest lands.

Simplifying scientific jargon so that women in the field can understand and relate to scientific discoveries and innovations in the field of environment preservation.

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सतत् संरक्षण में वन्य जीव पर्यटन की भूमिका

ए0एस0 नेगी भा0 वन0 से0

सभ्यता के विकास के साथ-साथ मनुष्य में पर्यटन या देशाटन का शौक भी बढ़ा है। मानव की यह प्रवृत्ति नयी नहीं है कि वह नये-नये स्थानों को देखे। इसी जिज्ञासा के कारण वास्को-डी-गामा ने भारत की खोज की तथा कोलम्बस ने नई दुनिया ढूँढ निकाली। मनुष्य बड़े से बड़े जोखिम उठाकर भी दुर्गम व कठिन स्थानों पर जाने के लिए उत्सुक रहता है। इसी प्रवृत्ति के कारण दुनिया की ऊँची से ऊँची चोटी, गहरे से गहरा सागर, उत्तरी तथा दक्षिणी ध्रुव जैसे दुर्गम स्थान, बड़े से बड़े मरुस्थल, घने जंगल मनुष्य की पहुँच से बाहर नहीं रहे। इतना ही नहीं वह इस दुनिया के अतिरिक्त अन्य ग्रहों पर भी पहुँच रहा है। चाँद पर मनुष्य अपनी उपस्थिति अंकित कर चुका है और अन्य ग्रहों पर भी जाने की कोशिश में लगा है। मानव की यह प्रवृत्ति न केवल बनी रहेगी वरण यातायात के सुगम व तीव्र साधनों के विकास के साथ बढ़ती रहेगी।

एक समय था जब मनुष्य बिना पूर्व जानकारी के नए-नए स्थलों पर बड़ी कठिनाई से जाता था। अब अधिकांश स्थानों की जानकारी आसानी से बिना उन स्थानों का भ्रमण किए हासिल की जा सकती है। फिर भी हर एक व्यक्ति की यह प्रवृत्ति होती है कि वह स्वयं उन स्थानों पर पहुँचकर नया अनुभव प्राप्त करे। प्रत्येक स्थान की पूर्व जानकारी के कारण पर्यटकों की जिज्ञासा बढ़ना भी स्वाभाविक है।

पर्यटन का उद्देश्य रुचिकर स्थलों पर स्वयं पहुँचकर उनका आनन्द लेने के साथ-साथ वहाँ की सभ्यता, रहन-सहन, संस्कृति (Culture), रीति-रिवाज, प्राकृतिक दृष्ट्यों, वन्य जीवों, मानव द्वारा निर्मित प्रतीकों, आदि का अवलोकन व अध्ययन करना भी है। मात्र धार्मिक भावना से तीर्थस्थलों की यात्रा करना तीर्थाटन की श्रेणी में आता है। तीर्थाटन भी पर्यटन की भावना से किया जा सकता है।

पर्यटन के प्रकार

पर्यटन के मुख्य उद्देश्य को दृष्टि में रखते हुए पर्यटन निम्न प्रकार के हो सकते हैं :

1. सामान्य पर्यटन (General Tourism)
2. वन्य जीव पर्यटन (Wildlife Tourism or Eco-tourism)
3. साहसिक पर्यटन (Adventure Tourism)

1. सामान्य पर्यटन:

इसमें, पर्यटक बिना किसी विशेष उद्देश्य के हर प्रकार के पर्यटन स्थलों का भ्रमण करता है। ऐतिहासिक महत्व के स्थल, प्राचीन स्मारक, भौगोलिक महत्व के स्थल, धार्मिक स्थान, आधुनिक शहर व इमारतें, वैज्ञानिक चमत्कार वाले स्थान, औद्योगिक महत्व के स्थान, प्राकृतिक सौन्दर्य के लिए प्रसिद्ध स्थल आदि पर विशेष बल दिया जाता है। ऐसे पर्यटकों की संख्या सर्वाधिक होती है और इस प्रकार के पर्यटकों में किसी विषय विशेष में अधिक रुचि नहीं होती है।

2. वन्य जीव पर्यटन :

यह एक आधुनिक प्रकार का शौक है। इसे इको पर्यटन भी कहते हैं, पर्यटक राष्ट्रीय उद्यानों, वन्य जीव अभ्यारण्यों, घने वनों आदि का भ्रमण वन्य प्राणियों की जानकारी करने के उद्देश्य से करता है। प्रकृति से विशेष लगाव रहता है तथा अधिक समय तक एक स्थान पर रहना चाहता है। विशेषकर एकांत प्रेमी पर्यटक होते हैं जिनकी रुचि फोटोग्राफी, लिखने-पढ़ने व नई जानकारी करने की होती है। एक पर्यटक बार-बार उन्हीं स्थानों पर जाना चाहता है जो उसे रुचिकर लगता है। ऐसे पर्यटक जागरूक होते हैं तथा प्रकृति संरक्षण (Conservation) में विश्वास करते हैं। इनमें से अनेक पुराने शिकारी भी हो सकते हैं जिन्हें वनों व वन्य प्राणियों का ज्ञान रहता है। सुख-सुविधाओं की अधिक परवाह नहीं करते हैं। जो पर्यटक मात्र फैशन से इस प्रकार का पर्यटन अपनाते हैं, उन्हें अच्छा व सही मार्गदर्शन देने पर वे भी अच्छे वन्य जीव पर्यटक बन सकते हैं। राष्ट्रीय उद्यानों व अभ्यारण्यों में आने वाले सभी पर्यटक वन्य जीव पर्यटक नहीं होते हैं। कुछ सामान्य पर्यटक भी जिज्ञासावश एक बार आ जाते हैं।

3. साहसिक पर्यटन :

यह काफी समय से प्रचलित है। इस श्रेणी में पर्वतारोहण, ट्रेकिंग या लम्बी व दुर्गम दूरियों को पैदल चलकर पार करना, लम्बी व दुर्गम यात्राएँ (विभिन्न साधनों से) करना व दुर्गम स्थलों जैसे-घने जंगलों, मरुस्थलों, पहाड़ी प्रान्तों, ऊँची पर्वत चोटियों आदि में जाना होता है। इनकी संख्या अत्यधिक कम होती है परन्तु ये पूर्ण रूप से समर्पित पर्यटक होते हैं। इन्हें भी प्रकृति से प्रेम होता है तथा ये सादा व कठिन जीवन बिता सकते हैं।

वन्य प्राणी पर्यटन का उद्देश्य

जैसा कि पूर्व में स्पष्ट किया जा चुका है, वन्य प्राणी पर्यटन आधुनिक पर्यटन है। यूँ तो काफी समय पूर्व से कुछ गिने चुने लोग इस उद्देश्य से दूर-दूर तक भ्रमण करते थे परन्तु धीरे-धीरे दुनिया भर के लोगों में वन्य प्राणी पर्यटन की ओर रुचि उभर रही है। विभिन्न प्रकार की जलवायु तथा विभिन्न प्रकार के वनों में विभिन्न प्रकार के वन्य जीव पाये जाते हैं। जितनी भिन्नता संसार भर के वन्य जीवों की है उतनी विन्नता शायद ही अन्य किसी में हो। टाइगर या शेर केवल एशिया में पाये जाते हैं। चीते केवल अफ्रीका में पाये जाते हैं। कंगारू आस्ट्रेलिया में मिलता है। भारत ही ऐसा देश है जिसमें शेर व बब्बर शेर दोनों पाए जाते हैं। हाथी मात्र एशिया के कुछ देशों (एशियन हाथी) तथा अफ्रीका में (अफ्रीकन हाथी) पाये जाते हैं अफ्रीका में एन्टीलोप की अनेक प्रजातियाँ होते हुए भी डियर की कोई प्रजाति नहीं पाई जाती है। एक सींग वाला गैण्डा (Great Indian Rhinoceros) केवल भारत व नेपाल में ही पाया जाता है। अफ्रीका में जो अफ्रीकी गैण्डा पाया जाता है वह इससे भिन्न होता है। विभिन्न देशों व जलवायु में विभिन्न प्रकार के वन्य जीवों के पाये जाने के कारण वन्य जीव पर्यटन रुचिकर हो जाता है। यही कारण है कि विभिन्न देशों के वन्य प्राणी पर्यटक अन्य देशों में अपनी जिज्ञासा पूर्ण करने तथा आनन्द प्राप्त करने जाते हैं।

वन्य प्राणी पर्यटन का उद्देश्य मात्र विभिन्न प्रकार के वन्य जीवों का अवलोकन कराना ही नहीं है वरन् विभिन्न प्रकार के वास स्थलों की जानकारी करना भी है। वर्तमान परिपेक्ष्य में जब वन्य जीवों

के वास स्थलों का द्रुत गति से ह्रास हो रहा है और अनेक वन्य जीवों की प्रजातियाँ विलुप्त होने के कगार पर पहुँच गई हों, वन्य प्राणी पर्यटन का महत्व अधिक हो जाता है। यही एक तरीका है जिससे विश्व भर में वन्य प्राणियों के संरक्षण के लिए जागृति पैदा की जा सकती है। आधुनिक मानव जब औद्योगिकीकरण की होड़ में लगा हो और धन के पीछे भाग रहा हो, तो केवल खूबसूरत वन्य-प्राणी ही उसको अपने अस्तित्व का बोध करा सकते हैं। इसी माध्यम से व्यक्ति को संरक्षण (Conservation), पर्यावरण प्रदूषण के खतरों व प्रकृति प्रेम का बोध भी हो सकता है। इसी से व्यस्त मानव कुछ क्षणों की शांति अर्जित कर सकता है।

वन्यप्राणी पर्यटन और भारत

वन्य प्राणी पर्यटन की दृष्टि से भारत सर्वाधिक महत्वपूर्ण देशों में से एक है। भारत विश्व भर में अपनी महान प्राकृतिक विभिन्नता (Mega Biodiversity) के लिए प्रसिद्ध है। समुद्र तल से ऊँचाई स्थलीय संरचना, भूगर्भीय बनावट व जलवायु की विभिन्नता के कारण भारत में अनेक प्रकार की Environmental Conditions उत्पन्न हो जाती है जैसे— सदाबहार वन (Tropical Rain Forests), डेल्टा वन (Mangroves), ठंडे व गर्म रेगिस्तान, झाड़ीनुमा वन, शुष्क व नम पर्णपाती वन, बीहड़, (Ravines), मैदान, दलदलीय भूमि (Wetlands), शीतल व ऊँचे हिमालय, लम्बा समुद्र तट (Coast line), द्वीप समूह आदि। दुनिया में भारत की स्थिति इस तरह से है कि वह तीन मुख्य Bio Geographical Realms के तिराहे पर पड़ता है, अर्थात् इन्डो-मलायन, यूरेशियन तथा अफ्रो ट्रॉपिकल। तीन महान Realms के Biological – Elements के Interpersions व Commingling के कारण तथा पर्यावरण स्थिति की विभिन्नता के कारण, भारत की प्राकृतिक सम्पदा न केवल एक गौरव की बात है बल्कि भविष्य के लिए एक अनमोल खजाना भी है।

इसी कारण भारत में 500 से अधिक स्तनपाई जीवों की प्रजातियाँ पाई जाती हैं। जिसमें हाथी, इंडियन बाइसन (Greatest of existing Bovis) भारतीय गैण्डा (विश्व भर में सबसे बड़ा गैण्डा) हिमालय की सबसे बड़ी जंगली भेड़, बारासिंघा, थामिन, सबसे सुन्दर हिरन—चीतल, नीलगाय, चौसिंघा, कालाहिरन, माँसाहारी पशु, जैसे शेर, बब्बर शेर, बादली गुलदार, मारबल कैट, आदि तथा अन्य प्रजातियाँ जैसे हिमालयन फॉक्स, मारटिन, उड़ने वाली बड़ी गिलहरी, कस्तूरा मृग, लिटिल पेन्टेड बैट (दुनिया में सबसे रंगीला जीव) पाये जाते हैं। इतना ही नहीं भारत के वनों में एक निराला आकर्षण है जो पर्यटकों को बार-बार अपनी ओर आकर्षित करता है।

विश्व भर में पाई जाने वाली लगभग 8600 पक्षी प्रजातियों में से भारत में लगभग 2400 जातियाँ या उपजातियाँ पाई जाती हैं, जिसमें से लगभग 300 जातियों के पक्षी उत्तरी प्रदेशों से जाड़ों में यहाँ आते हैं। मोर, जंगली मुर्गे, ग्रेट इन्डियन बस्टर्ड, हार्न बिल, ट्रेगोपान, मोनाल, चीड फीजेन्ट जैसे खूबसूरत पक्षी भारत में पाये जाते हैं। इसके अलावा भारत में अनेक प्रकार के कीट पतंगे, सरीसर्प, एम्फीबियन तथा बहते व खारे पानी की मछलियाँ पाई जाती हैं। स्पोर्ट फिश जैसे महाशीर व ट्राउट भी भारत की अनेक नदियों में पाई जाती हैं जो पर्यटकों को आकर्षित करती हैं।

वर्तमान परिपेक्ष्य में वन्य प्राणी पर्यटन की भूमिका

चूँकि भारत में उक्त कारणों से विभिन्न प्रकार के वन्य प्राणी पाये जाते हैं और यहाँ की प्राकृतिक विविध

ता (Biodiversity) विश्व भर में प्रसिद्ध है अतः संसार भर से वन्य प्राणी पर्यटक भारत आते हैं। दुर्भाग्य से अफ्रीका की तरह हम इसे अधिक लोकप्रिय नहीं बना पाये हैं जिस कारण जितने पर्यटक यहाँ आने चाहिए उससे कम आ रहे हैं। हमारे देश में शेर, गुलदार, हाथी आदि की अधिकांश वनों में उपस्थिति के कारण वन्य प्राणी पर्यटन अफ्रीका से काफी अधिक कौतुहलतापूर्ण है। सुन्दर वनों व उनके वन्य प्राणियों की विविधता के कारण हम विश्व में सर्वाधिक वन्य प्राणी पर्यटकों को आकर्षित कर सकते हैं। इसमें न केवल विदेशी मुद्रा अर्जित करने के लिए यह एक प्रमुख साधन हो सकता है बल्कि वन्य प्राणी संरक्षण के प्रति विश्व भर में जागृति भी पैदा की जा सकती है। वन्य प्राणी पर्यटन न केवल राष्ट्रीय उद्यानों में ही प्रोत्साहित किया जाना चाहिए बल्कि इससे भी अधिक अन्य आरक्षित वनों व अभ्यारण्यों में इसे प्रोत्साहित करने की आवश्यकता है तभी हम पर्यटक जागरूकता के माध्यम से इस अमूल्य धरोहर की रक्षा भी कर सकेंगे।

वन्य जीव पर्यटन को लोकप्रिय बनाने के लिए गाइड की भूमिका

आज हमारे वनों, राष्ट्रीय उद्यानों तथा अभ्यारण्यों में अनेक पर्यटक आते हैं और बिना उनके सम्बन्ध में पूर्ण जानकारी लिये तथा बिना पूर्ण आनन्द लिए ही वापस चले जाते हैं। पर्यटक हमें, उनमें वन्य प्राणियों के प्रति जागृति लाने व उनका ज्ञान अर्जित करने का अवसर प्रदान करते हैं परन्तु हम उस अवसर का लाभ नहीं उठा पाते हैं। फलस्वरूप न केवल पर्यटक बिना ज्ञान अर्जित किये वापस जाता है बल्कि वह एक गलत धारणा का शिकार भी हो जाता है कि वनों में शेर या अन्य बड़े जानवर किसी कारणवश न दिखाई दिये तो वह सोचता है कि इनमें कुछ हैं भी या नहीं। अधिकांश पर्यटक शहरों से आते हैं और उन्हें जंगलों व जंगली जानवरों के बारे में मौलिक जानकारी भी नहीं होती है। वन विभाग के पास जो कर्मचारी, गाइड के रूप में हैं, उनकी संख्या अत्यन्त कम है तथा उन्हें भी पूर्ण प्रशिक्षण प्राप्त नहीं है। अतः यह नितान्त आवश्यक है कि पर्यटकों को वन्य प्राणियों के अवलोकन के लिए प्रशिक्षित व दिलचस्प गाइड की सेवायें प्राप्त हों, गाइड, पर्यटकों को वनों, पेड़-पौधों, जंगली जानवरों, प्राकृतिक स्थलों (Natural Features) पक्षियों, आसपास की जनजातियों तथा ग्रामीणों आदि के बारे में सही व दिलचस्प जानकारी देकर उनके पर्यटन को शिक्षाप्रद, आकर्षक, दिलचस्प व कौतुहलपूर्ण (Thrilling) बना सकता है। गाइड का मुख्य कार्य प्रकृति का सही रूप से चित्रण (Interpretation) करना है। प्रकृति चित्रण के लिए कुछ विषयों की न्यूनतम जानकारी देना तथा इससे उनकी रुचि प्रकृति तथा संरक्षण (Conservation) की ओर ढालना है। यह उन्हें इस विषय की दीक्षा देना मात्र है (Initiation), बाकी वे अभ्यास रूपी साधना से स्वयं अनुभव प्राप्त कर सकेंगे। उन्हें उन पुस्तकों की जानकारी भी प्रशिक्षण के दौरान हो जायेगी जिससे वे अपना ज्ञान आगे बढ़ा सकते हैं। उन्हें उन संगठनों व प्रशिक्षण केन्द्रों की भूमिका का भी ज्ञान दिया जाना चाहिए जो इस ओर कार्य कर रहे हैं। गाइड को न केवल प्रकृति चित्रण व वन्य प्राणियों की आदतों का ज्ञान अर्जित करना काफी है बल्कि उसे अपनी पंच इन्द्रियों को भी इस ओर ढालना होगा। अपनी इन्द्रियों को इतना संवेदनशील (Sensitive) बनाना होगा कि जंगल में प्रत्येक आवाज, उसकी इन्द्रियों को प्रभावित किये बिना न रहे। वन्य प्राणियों का ज्ञान अर्जित करने के लिए धैर्य (Patience) की आवश्यकता है। हो सकता है कि प्राकृतिक परिस्थितियों में लम्बे समय तक कुछ

दिखाई—सुनाई न दे परन्तु हिम्मत नहीं हारनी है। जंगल का अधिकतम ज्ञान जंगल में रहकर ही प्राप्त हो सकता है। कहते हैं कि जिम कार्बेट की छठी इन्द्री (Sixth Sence) अत्यधिक जागृत थी और उन्हें जंगल में होने वाले हर क्रिया—कलाप का आभास हो जाता था। यह तभी सम्भव हुआ जब उन्होंने जंगलों में लम्बे रास्ते तय किये, कई दिन—रातें गुजारी और अपनी इन्द्रियों को इस काबिल बनाया। जंगलों की अपनी भाषा है, जानवरों के अपने तौर तरीके हैं, जितना अनुभव मिलेगा उतनी ही दिलचस्पी बढ़ती जायेगी।

गाइड को अपना कोई शौक (Hobby) भी पालना आवश्यक होता है, जैसे फोटोग्राफी, वन्य प्राणियों की पुस्तकों का पठन—पाठन, पक्षी निहारना (Bird watching) आदि। अपने पेशे को सुदृढ़ बनाने के लिए कोई न कोई शौक अवश्य होना चाहिए।

गाइड को जितना अधिक ज्ञान होगा वह पर्यटक के लिए उतना ही अधिक उपयोगी होगा।

गाइड की एक अहम् भूमिका सामान्य पर्यटकों को प्रकृति संरक्षण की ओर ढालना भी हो सकती है। वह अपने अनुभव व ज्ञान से साधारण पर्यटकों में प्रकृति प्रेम जगा सकता है तथा उपभेक्तावाद (Consumerism) को कम कर सकता है। उदाहरण के लिए वह पर्यटकों को यह याद दिला सकता है कि पेड़ों से बनने वाले कागज का वह किस लापरवाही से प्रयोग करके जंगलों के विनाश में हाथ बंटा रहा है। छोटी—छोटी असावधानियों से वह कैसे प्रकृति वह प्राकृतिक खजानों पर चोट कर रहा है। बच्चों पर इस तरह की जानकारी का गहरा असर पड़ सकता है और वे अपनी जीवन शैली (Life Style) इको—फ्रैन्डली (Eco-Friendly) बना सकते हैं।

वनों व वन्य जीवों का संरक्षण मात्र सरकारी प्रयासों से अब सम्भव नहीं रह गया है। वनों को आग से बचाना हो या नाजायज शिकार और नाजायज कटान की रोकथाम करना हो अथवा चराई, शाख तरासी या अन्य प्रकार से वनों को पहुँचने वाली क्षति को नियंत्रित करना हो, बिना जन सहयोग के कुछ भी सम्भव नहीं है। जनसहयोग प्राप्त करने के लिए यह आवश्यक है कि आस पास के ग्रामीणों को वनों से जीविकोपार्जन का स्थायी साधन मिले जिससे वनों को क्षति भी न पहुँचे और ग्रामीण वनों के अप्रत्यक्ष लाभों के प्रति सजग भी हों। वन्य जीव पर्यटन तथा इको पर्यटन ऐसा स्थायी साधन है जिससे यदि पूर्णरूप से नियंत्रित व नियमित किया जाये तो ग्रामीणों को सतत् रूप से रोजगार भी मिलेगा और अपने रोजगार को बरकरार रखने के लिए ग्रामीण भी वनों व वन्य जीवों का सतत् रूप से संरक्षण सुनिश्चित करेंगे। इस प्रकार के पर्यटन से ग्रामीणों को पर्यटकों का मार्ग दर्शन करने के साथ साथ उनके लिए रहने, खाने व अन्य सुविधायें उपलब्ध कराने का अवसर मिलेगा तथा आवागमन हेतु आवश्यक साधन भी ग्रामीण विकसित करेंगे। पर्यटकों को सांस्कृतिक कार्यक्रम, स्थानीय उत्पाद, स्थानीय हस्तकला से बनी वस्तुएं आदि उपलब्ध कराकर भी आय के अतिरिक्त साधन उपलब्ध होंगे। यदि ग्रामीणों को वन्य जीव पर्यटन से मिलने वाले उक्त लाभों का सिलसिला शुरू हो गया तो कोई वजह नहीं कि ग्रामीण उस संसाधन की सतत् रूप से रक्षा न करें जिसके कारण उनको जीविकोपार्जन प्राप्त हो रहा है। ग्रामीणों का धीरे—धीरे अपने आस—पास के वनों एवं वन्य जीवों से गहरा सम्बन्ध स्थापित हो जायेगा। साथ ही आने वाले पर्यटक भी संरक्षण के प्रति जागरूक होंगे जो अंततोगत्वा जैव विविधता संरक्षण में सहायक होगा।

From the Archives of "Cheetal"

(I) IS MOUNTAIN QUAIL EXTINCT?

I.S. Negi, I.F.S. (Retd.)

Mountain Quail (*Ophrysia superciliosa*; India-Mussoorie), is a smallish, relatively long tailed slaty brown partridge with conspicuous red bill and feet. The full grown ones acquire a length of 25 cm. Bill thick and short with upper mandible overhanging the lower; legs short and usually armed with one or more pointed spurs in male; hallux always present, claws short, blunt and very strong for scratching food from the ground. Wings short and rounded, flight swift and strong but not for long distances. Normally feeds on grain, seeds, tender shoots, fruits, berries and insects etc. Lays eggs in open scrapes with no or scanty lining. Young nudifugous and downy.

Very little is known about the distribution, habitat and status of the Mountain Quail. It was known to occur only in Western Himalayas, between 1650 metres (Jharipani above Dehra Dun) and 2110 metres elevation. (Banog, Bhadraj, behind Mussoorie and Sher-Ka-Danda near Nainital).

As regards the general habits, it was found in convoys of 5 or 6 in patches of long grass and brushwood on steep hill slopes. It flew rather reluctantly when almost trampled upon and that only for short distances, soon pitching into the grass again.

The last specimen of Mountain Quail was procured from Sher-Ka-Danda near Nainital in 1876 and since, when through combing of its known habitat and places of identical ecology has failed to discover the bird, it was believed that the once endemic bird is now most probably extinct.

The primary reason for its extinction is deterioration of habitat. At the advent of first colonisation of Mussoorie by the middle of nineteenth century the sleepy hill range of Mussoorie suddenly burst into human activities. This was in the last century when the things were within manageable limits. But at the turn of twentieth century, particularly after independence, indiscriminate cutting of forests, frequent fires, excessive grazing, unplanned road and building construction and above all open cast mining for lime stone brought near disaster to hitherto serene environment of Mussoorie hills. The increased human activity brought a sea change in the habitat of Mountain Quail as also of many other animal and plant species. Mussoorie hills (Banog, Bhadraj and Masrana) were safe haven for Mountain Quail, which fed on insects, fruits, seeds, berries and herbs existing naturally in abundance. But changed environment seems to be responsible for pushing this beautiful bird to the brink of extinction. Any major disturbance in the habitat leads to migration of birds and animals. But then the pheasants and partridges are not migratory as they do not take long flights. The hapless Mountain Quail, therefore, preferred to die rather than flee the burning house.

Whether the Mountain Quail has really become extinct or has merely gone into oblivion is a million dollar question. Notwithstanding, the widely held belief that the Mountain Quail has become extinct, rumours and hearsays have kept alive the hope of its existence.

Even late D. Salim Ali, the world fame Ornithologist has not lost hope of retrieving this bird. On 13-7-1984 he wrote a letter to the Commandant of Indian Military Academy, Dehra Dun and also sent a copy to the Chief Wildlife Warden, Uttar Pradesh, Lucknow, in which he stated that in the month of October 1984 he would be making fresh attempt to discover the Mountain Quail in the hills around Mussoorie. for which he hoped to secure the participation of the Commandant himself, some officers and cadets of the academy, particularly such as happen to possess trained gun dogs. He also enclosed a note he had prepared after his last abortive attempt to discover the bird 3 to 4 years ago. At that time he had only a single spaniel with him, but he was hopeful that if they could muster 3 to 4 parties of enthusiasts with several dogs, each to flush the birds from the undergrowth in deep 'khuds' there would be better chances of success. He also assured the Commandant that in the proposed exercise he would receive full co-operation from the state Forestry and Wildlife departments, staff and trainees of Wildlife Institute of India and Forest Colleges and hopefully of some members of the Wildlife Preservation Society of India.

Dr. Salim Ali did come to Mussoorie on 23/24 July. 1984 for giving a talk to the probationers of Lal Bahadur Shastri National Academy of Administration, but the much publicised action plan scheduled for October 1984 for discovering Mountain Quail did not materialise, presumably due to poor health of Dr. Salim Ali.

The Chief Wildlife Warden, U P. sent copy of Dr. Salim Ali's letter to me, since I was the then Divisional Forest Officer at Mussoorie and directed me to render all possible help to Dr. Salim Ali in his mission. I met Dr. Salim Ali on 23rd of July 1984 at Dehra Dun and accompanied him upto Mussoorie. He explained the whole scheme to me and gave two photographs of male Mountain Quail to me, so that I could identify the bird in case I sighted one anywhere in the forest. Since then, I was carrying the photographs with me wherever I went on tour or excursions in my division.

One day in the month of August 1984 I happened to go to wood Stock School at Mussoorie, where I met Mr. Kapadia, who was an old 'shikari' and had intimate knowledge of the terrain and flora and fauna of Mussoorie hills. In course of our conversation Mr. Kapadia told me that he saw Mountain Quail near Suwakholi a few years back. I found some substance in his statement. The area around Suwakholi possesses a shrubby growth of *Prinipea utilis*, *Lonicera angustifolia*, *Berberis asiatica* and *Gerardiana heterophylla*. The former three species bear pulpy fruits on which Mountain Quail could feed, while nestle in thick bushes of *Gerardiana*.

Despite the revelation by Mr. Kapadia I did not rate the chances high of sighting Mountain Quail near Suwakholi. The possibility of getting it in Banog or Masrana was uppermost in my mind. I decided to reconnoitre these areas before Dr. Salim Ali launched the campaign real, in the month of October. But on a foggy morning of September, when I was going to Nali for inspection of plantations, I saw halt a dozen Mountain Quail like birds crossing the motor road near Suwakholi. I stopped the jeep and took out the photographs of Mountain Quail I was carrying with me and tried to compare it with the living birds. After crossing the motor road some of them paused for a few seconds, while others crawled uphill. The entire convoy comprised of young birds, presumably

six months to one year old. They were in full view of me and my staff, who were accompanying me in the jeep. I showed the photographs to my staff also and all of us were of the unanimous opinion that birds we saw were in all probability Mountain Quail. One remarkable feature which gave credence to our belief was red legs of most of the birds. The male Mountain Quail has characteristic red legs.

I had no camera nor a gun with me and, therefore, could not shoot the birds either way. After a few minutes the birds slowly moved up and disappeared in the misty surroundings. We also left the place amply satisfied.

On our return the same afternoon and at the same place a still bigger flock of same bird flew over our jeep across the road and perched on the grassy slope below the motor road. We got down from the jeep and fanned on all directions, but could not locate the birds in the fog. This time too I had a full view of the birds and could not have mistaken them for other partridges and pheasants found in this region.

In the absence of any authenticated proof neither I informed Dr. Salim Ali nor made an official record of the incident. But I did certainly talk about this incident to my friends and acquaintances at Mussoorie and Dehra Dun, where this episode received wide publicity. Whereas my talks regarding sighting the Mountain Quail remained subdued those of my staff were loud and clear. Thus the news of discovery of Mountain Quail spread all over Mussoorie and reportedly reached Delhi also.

Inspired by this event, I decided to discover the Mountain Quail on my own. I unfolded my plan to some conservationists and Wildlife enthusiasts. They cheered me and suggested that I launched a full fledged project for trapping the bird. Preliminary inquiries in this matter revealed that for the implementation of a project of this kind and magnitude, huge paraphernalia consisting of zoom lens camera, nylon smoke nets gun dogs, half a dozen beaters and a couple of bird trappers would be required. Thus the entire operation would cost tens of thousands of rupees in addition to lot of time and patience. Naturally, I was not in a position to afford all this while in service for administrative restraints and after retirement owing to financial constraints.

It may be reckoned that discovering Mountain Quail is money and time consuming exercise, that can only be taken up by the Government or rich voluntary organisations. The oblivious status of Mountain Quail has unfortunately not attracted the attention and thought of the conservationists, with the result that, whether the Mountain Quail exists or has become extinct, still remains an enigma.

It will be a befitting tribute to late Dr. Salim Ali if the conservationists and like minded people persuade the Government to complete his unfinished task of discovering Mountain Quail so that the controversy, whether this mythical bird still exists or has become fossil, may be laid at rest.

(II) MUSK

Copy of letter No. 654-(4)/EO/18621 dated the 14th October 1958 from the Director, National Chemical Laboratory, Poona-8 to the Secretary, Indian Board for Wild Life, New Delhi.

We received your letter and have noted the contents very carefully.

Muscone is the active constituent of musk. The dry musk pod of a full-grown musk deer may weigh about 28 grams, of which the muscone-contents will not exceed 0.3 gm. Therefore, the musk deer is no longer regarded as a particularly rich source of muscone. It may also be pointed out that several genuine substitutes of muscone are already available in the market. The most important members of this group are exaltone, exaltolide, ambretolide, cis-civetone, dihydro-civetone etc. First three components of this series are being regularly manufactured in Switzerland, America, Germany and Britain. Probably, ciscivetone is also available from Swiss sources. Swiss scientists have also established actual synthesis of muscone, and it is quite possible that muscone is already being marketed under some trade name as such, or in the form of blends. The price of these genuine musk substitutes may vary from Rs. 1500 to 3000 per 500 grams.

During the last few years in the National Chemical Laboratory, we have been carrying out work on the preparation of musk-like products using Indian raw materials and have developed new methods of synthesis which are commercially feasible and are superior to the methods described in the literature, including those developed by the Swiss scientists. Some of our methods are already undergoing pilot plant trials. Employing our results, it should be quite possible to prepare substantially large quantities of these musk substitutes in India with-out any serious difficulty.

In view of this development, it seems perfectly justifiable to discontinue the old practice of killing musk deer for supplying raw materials to the perfumery industry.

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Cheetal

Quarterly News

Wildlife Preservation Society of India organised a book release function.

In a simple ceremony organized at Raj Bhawan, Dehra Dun by The Wildlife Preservation Society of India, H.E. The Governor of Uttarakhand, Sri Sudarshan Agarwal released the book "Uttaranchal – The Land of Colourful Birds" by Sri Bhagat Singh, a life member of The Wildlife Preservation Society of India, Dehra Dun, on 10th October, 2007. The Governor in his address said that the book is not merely a field guide of birds but it reflects the deep interest and dedication of the author, who has spent almost four decades in the field of Wildlife Photography and Study. While stressing the importance of birds as indicators of the health of the planet earth the Governor made a call to the young generation to take up bird watching as a hobby. He also praised the activities of The Wildlife Preservation Society of India as the oldest such organization in North India which is spreading awareness about wildlife conservation through its quarterly journal "Cheetal". Sri Vinod Rishi, IFS (Rtd.) Ex- ADG (Wildlife), Ministry of Environment & Forests, GOI, welcomed the Chief Guest. Sri A.S. Negi IFS (Rtd.), Executive Vice President of The Wildlife Preservation Society of India introduced the Author and Sri Narendra Singh, Director, Corbett (Wildlife) Training Centre, Kalagarh, Life Member of The Wildlife Preservation Society of India gave the vote of thanks. Among others present in the function were Lt. Gen. (Rtd.) R. K. Jasbir Singh, Sri S.K. Mukherji, Ex – Director, Wildlife Institute of India and President of Friends of Doon Society, Members of The Wildlife Preservation Society of India, birdwatchers, conservationists, students and a large representation of press & media.

Uttarakhand Forest Development Corporation becomes Patron of Wildlife Presentation Society of India.

Uttarakhand Forest Development Corporation has become patron of Wildlife Preservation Society of India by contributing Rupees 25000/= (Rupees twentyfive thousand as membership fee. The society is thankful to Sri Dalip Singh Tomar, The Managing Director & Sri R P Kala Regional Manager UFDC who is also the life member of the society.

The following members enrolled themselves as various kind of members of Wildlife Preservation Society of India during last quarter.

S No.	Name of Individual/ Institute	Type of Membership
1	Mr Deepak Rai Kurukshetra University Harayana	Annual
2	Dhrubjyoti Chandra Hospital Road, PO Aullavehorra Distt Karimganj , Assam	Annual

- | | | |
|---|---|---------------------------|
| 3 | Corbett Foundation
P.O Dhikuli, Ramnagar
Nanital | Institutional Life Member |
| 4 | Director Corbett Hideaway
Garjia Dhikuli,
PO Dhikuli, Ramnagar | Institutional Life Member |
| 5 | Tiger Heaven Society,
Camp Office:-
A- 29, RK Puram, Kalyanpur(West)
Lucknow | Institutional Life Member |
| 6 | Head Master Krishi Autyogik
Vidhyalaya, Aau, Attara
Banda, U.P. | Institutional Life Member |
| 7 | Director Wildlife Institute of India
P.O Chandrabani
Dehradun | Institutional Life Member |

Book Review

Uttaranchal: Land of Colourful Birds

Writer: Bhagat Singh

Publisher: Ajanta Offset and Packaging Limited, New Delhi

Pages: 153 with High Quality Colour Photographs of 297 Bird Species.

Released on: 10/10/2007

This is an outstanding book on birds describing about 300 bird species each with a clear photograph taken by the Author who is a keen photographer with a high degree of patience. The book has nearly 400 photographs including those of rare Himalayan landscapes, bird-activities, nests, eggs, young ones, parental care etc. The photographs together with excellent and interesting text offer an exciting reading not only to the bird watchers but also to those who have an interest in nature. This is an excellent gift for those who want to pursue bird watching as a hobby. Long introduction running to 22 pages gives a detailed description of Uttarakhand as an abode of nature and some basic facts about birdlife. The Chapter "Dazzling Jewels of the Birds Galaxy of Uttaranchal" gives a brief description of about 300 important bird species of Uttarakhand each with a distinctive photograph of the bird to help the reader in easy identification. The Chapters "Birds in Flight", "Habitats & Nests", "Eggs", "Breeding and raising the Young", "Preening, Molting and Hygiene", "Migration", "Little Angels of the Sky", "Galliformes", "Bird Watching" and "Some Facts about Birds" offer interesting reading to Ornithologists and great excitement to the beginners in bird watching. The book is a beautiful guide to those who want to chose Uttarakhand as a nature study destination with special emphasis on Bird Watching. The print quality of photographs and text as also the overall layout of the book including its cover page are marvellous. The text gives a flavour of the long experience of the Author extending into 4 decades of nature study, photography and identifying himself completely with nature.

Quest for holy water harming hill ecology Too Many Kanwariyas Dirty Gangotri Glacier Zone

Dehradun: Every year, several Voices are raised about deterioration of Gangotri shrine and its surrounding areas, including Gangotri glacier and its mouth Gaumukh. But these voices are drowned in the cacophony of religious fervour and trampled under the feet of thousands of pilgrims who visit Gangotri and Gaumukh.

The rush of pilgrims is particularly high in the month of "sravaan" when thousands of "kanwariyas" converge at Gangotri glacier area to collect the holy water.

Priests, saints, environmentalists and local people of the hill region and even the government-all agree that too many pilgrims exert too much pressure on the fragile ecology of the area. This has resulted in steady deterioration of the environment of the area. Despite the lip-service, nothing has actually been done on the ground level either to protect the ecology or regulate the number of pilgrims to Gangotri and beyond.

A couple of years ago, state government had proposed to implement selective entry by issuing permits to people wishing to go beyond Gangotri shrine in Uttarkashi district, But no steps have so far been taken to implement this.

Once again, thousands of "kanwariyas" have began to arrive at the shrine for "darshan" and collect holy water. Many thereafter, trudge up to Gaumukh, leaving a trail of refuse and plastic waste.

Again, voices of concern about maintaining ecological balance in Gangotri region have been raised.

A group of sadhus and local villagers near Gangotri have even tried to prevent the "kanwariyas" from going to Gaumukh by sitting on a dharna to protest against their entry to the glacier zone. But to no avail.

Others like Rawal Harish Semwal, secretary of Shree Panch Mandir Samiti, are trying to use the power of persuasion. "We appeal to 'kanwariyas' not to bring non-biodegradable products into the area. We also request them not to go beyond Gangotri shrine," said Semwal.

The sea of "kanwariyas" is not just a strain on the ecology but has brought with it a host of civic problems-parking, garbage and inadequate supply of drinking water and power. Shanti Thakur, who heads Gangotri Glacier Bachao Abhiyan, is of the view that the glacier should be left free of visitors for at least 10 years. Her group has launched a campaign in places like Haryana to make people, particularly Kanwariyas, aware about the environment and how not to disturb the ecology of the area.

Thakur, however, said "kanwariyas" and other pilgrims and tourists alone were not responsible for destroying the environment. Construction of roads in the area was causing extensive damage to the area. This, too, needed to be stopped, she added.

She demanded that Central government should chalk out a clear-cut policy on conservation of Gangotri glacier.

Source : The Times of India, New Delhi Wed, August 8, 2007

Villagers to guard Ranthambore

Jaipur: After taking the decision to recruit former soldiers to guard wildlife sanctuaries in the state, Rajasthan government is now planning to involve people living in villages around Ranthambore National Park to protect wildlife.

"The forest department has drafted a proposal under which youths living in villages near the national park would be entrusted with the task of protecting wild animals," an officials said here.

The proposal would now be sent to the state government for approval. In the first phase, 225 villagers would be recruited. Later, the figure would be increased.

The department is of the view that crimes like grazing of cattle on forest land and felling of trees for firewood can be stopped if villagers become guards. The step can also curb poaching because villagers will become "informers".

The process to appoint 1,000 ex-soldiers to help guard wildlife sanctuaries throughout the state has already begun. Rajasthan has two tiger projects, a bird sanctuary and 25 wildlife sanctuaries besides 32 "closed areas".

"For the safety of wildlife and to curb the incidence of poaching, as many as 1,000 retired soldiers would be hired and deployed on a contract basis in various sanctuaries and national parks at a monthly remuneration of Rs. 4,000," LN Dave, Rajasthan's forest minister, said.

He said the former soldiers would be given intensive training and also be provided with firearms.

Though no official statistics have been released so far, sources in the forest department said that 125 security personnel would be deployed in Ranthambore, 100 in Sariska, 75 in Udaipur, 70 in Chittorgarh and 55 in Jaipur and Kota each.

The Ranthambore National Park sprawls across 640 sq km and has 63 forest guards, 10 assistant conservators and 15 foresters, while the Sariska Tiger Reserve covers 881 sq km and has about 74 forest guards and 25 assistant conservators.

Keoladeo Bird Sanctuary has 31 forest guards, eight assistant conservators and eight foresters.

Source : The Times of India, New Delhi Wed, August 8, 2007

FAQs

Global warming/climate change

Q: What causes global warming?

A: Global warming is literally the warming of our planet caused by a steadily thickening blanket of gases such as carbon dioxide and other air pollutants that is building up in the atmosphere. This blanket of hot-house gases traps the sun's heat and causing the planet to warm up. Now you might ask, what are the sources from which these hot-

house gases come? For a developed nation like the US, coal-burning power plants are the largest source of carbon dioxide pollution-they produce 2.5 billion tons every year. Automobiles, the second largest source, create nearly 1.5 billion tons of CO₂ annually. In fact, the United States emits more carbon dioxide than China, India and Japan, combined.

Q: Why should we be worrying about it?

A: In February 2004, consultants to the Pentagon released a report laying out the possible impacts of abrupt climate change on national security. In a worst-case scenario, the study concluded, global warming could make large areas of the world uninhabitable and cause massive food and water shortages, sparking widespread migrations and war. While this prospect remains highly speculative, many of global warming's effects are already being observed-and felt. And the idea that such extreme change is possible underscores the urgent need to start cutting global warming pollution. In 2003, for example, extreme heat waves caused more than 20,000 deaths in Europe and more than 1,500 deaths in India. And in what scientists regard as an alarming sign of events to come, the area of the Arctic's perennial polar ice cap is declining at the rate of 9% per decade. Similarly, the recently reported 'retreat' of the Himalayan glaciers (not to forget baring of some of the snow peaks in Tibet and central Asia) some of which feed major river systems of northern India, could have catastrophic impact on the life and economies of the Indian Sub-continent.

Q: What other hassles can global warming cause?

A: Melting glaciers and ice caps will lead to rising sea levels. That in turn would lead to coastal flooding all around the globe. Warmer sea surface temperatures will fuel more intense hurricanes in the southeastern Atlantic and Gulf coasts. Forests, farms and cities could also face troublesome new pests and more mosquito borne diseases. Disruption of habitats such as coral reefs and alpine meadows could drive many plant and animal species to extinction.

Recently, researchers have investigated the possibility of abrupt climate change, in which gradual global warming triggers a sudden shift in the earth's climate, causing parts of the world to dramatically heat up or cool down in the span of a few years.

Q: In all this gloom and doom, isn't there a glimmer of good news?

A: Of course there is! Here's the good news: technologies exist today to make cars that run cleaner and burn less gas, modernise power plants and generate electricity from nonpolluting sources, and cut our electricity use through energy efficiency. The challenge is to be sure these solutions are put to use. Domestic lighting, for instance, could be more easily targeted for energy saving than changing the design of multi-million-dollar coal-fired power plant. Yet experience shows that the cheapest sources of abatement are among the most difficult for policy-makers to get at.

Q: So what can I, as a concerned citizen, do to help fight global warming?

A: There are many simple steps you can take right now to cut global warming pollution. Make conserving energy a part of your daily routine. For example, switch from a standard incandescent light bulb to a CFL, says Theo van Deursen, chief executive of Philips Lighting. The payback on investing in a CFL (compact fluorescent bulb), is less than half

a year. The good news is that sales are rising faster in developing world, where people are far more cost-and energy conscious than their more profligate counterparts in richer countries.

Each time you choose a compact fluorescent light bulb over an incandescent bulb, you'll lower your energy bill and keep nearly 700 pounds of carbon dioxide out of the air over the bulb's lifetime.

Q: How can I, along with other concerned citizens, ensure that all our single steps towards energy efficiency, add up to a zillions of eco-friendly miles?

A: To quote just one example, Philips aims to inspire more than two billion people to take simple steps, such as changing a light bulb, to lead a more energy efficient life. Part of the campaign is a consumer website www.asimpleswitch.com, launched on July 4 2007. Philips has also partnered with The Alliance for Climate Protection and the global Live Earth concerts for this purpose. Visitors to the Live Earth concerts and the Live Earth and MSN websites will be invited to record a personal 'simple switch' pledge either online or via SMS. Philips will track these collective pledges to change to energy efficient lighting and calculate the resulting energy and costs savings on the asimpleswitch.com website. "Our asimpleswitch.com program provides the perfect forum to show solutions for efficient energy use and the simple steps that we all can take in order to make a real difference" said Theo van Deursen, member of the Board of Management of Royal Philips Electronics and CEO of Philips Lighting. "At Philips we believe in providing simple solutions for complex problems such as sustainable development.

Source : The Times of India, New Delhi Wed, August 8, 2007

'Recovery plan' for endangered species

Environment Ministry Has Also Proposed Creation Of More Marine Protected Areas

New Delhi: Putting the country's obsession with the charismatic tigers aside for a while, the ministry of environment and forests has proposed a 'recovery plan' for several endangered species, including the snow leopard, the great Indian bustard (a key grassland bird) and the hangul or the Kashmir stag. Alongside, shifting its focus from only terrestrial animals and plants, the ministry has proposed the creation of more marine protected areas.

The proposal to start a recovery plan for these and other key wildlife will come up at the mid-August meeting of the National Board of Wildlife headed by the Prime Minister. The Snow Leopard Project has been on the anvil for quite some time now despite the Planning Commission having rejected proposals for funding a project to save the high altitude species in this year's budget. Once approved, the project would provide support to the Himalayan states of Jammu and Kashmir, Uttarakhand, Himachal Pradesh, Sikkim and Arunachal Pradesh in providing protection to the snow leopard. As reported by TOI earlier, the environment ministry had set up a steering committee, that included key state officials, to pursue the matter.

While the government has listed several species, including the gangetic dolphin and the

wild buffalo, as needing special projects to prevent local extinction, it has at present pushed for immediate action on the great Indian bustard, lion and the hangul.

The decline of the great Indian bustard in the grassland areas has been well documented. The species, indicator of the health of the depleting grasslands, is seen as a way to protect not only wildlife but also village common land, that is a source of income to the landless and poor. Such common land is being fast encroached in Gujarat for agriculture and development.

The environment ministry has also suggested to the National Board of Wildlife to consider creating more marine protected areas as well as involving institutes like the Central Marine Fisheries Research Institute and the National Institute of Oceanography for collaborative research, realising that its own Wildlife Institute of India does not have the capacity of undertake all research in marine areas.

The wildlife board, the apexbody on all wildlife issues, will take decisions on these areas as well as pursue the tiger conservation agenda. Having admitted in the agenda document, as reported earlier by TOI, to a much lower figure of 1,300-1,500 tigers remaining in the country, the ministry has put on agenda a 10-point action plan. This includes finalisation of the criteria for declaring critical wildlife habitats as per the Forest Rights Act and delineation of the buffer areas outside the core of the tiger reserves.

Source : The Times of India, New Delhi Thu., August 9, 2007

Nuke energy: Clean, green option?

Finito. Finished. That was the nuclear energy debate after the Chernobyl explosion in 1986. Or, so everyone thought till the threat of climate change came along and the world woke up to the fact that burning fossil fuels for a planet with six billion energy-hungry souls just wasn't an option.

Suddenly, nuclear energy didn't seem so bad, with some dubbing it "the least worst solution to our need for a carbon-free energy source". And it wasn't just the vested interest groups who were using it as marketing pitch. High-profile environmentalists including Gala theorist James Lovelock, Greenpeace cofounder Patrick Moore, and Britain's Bishop Hugh Montefiore, a longtime board member of Friends of the Earth jumped ship as well, arguing that nuclear energy produces a fraction of the greenhouse emissions made from fossil fuels. A coal-fired plant, they pointed out, releases 100 times more radioactive material than an equivalent nuclear reactor.

Worries about emissions fuelled a change in Western Europe, with countries quietly backing away from planned nuclear phaseouts. Finland ordered a big reactor specifically to meet the terms of the Kyoto Protocol on climate change. China's new nuke plants- 26 by 2025 -are also part of a desperate effort at smog control.

So where does India stand in all this? The Indo-US deal is likely to determine how fast the country goes down the nuclear energy route. The hows may hinge on the 123

agreement but the whys are another matter. More than anxiety over rising emissions, it's the burgeoning demand for power-analysts peg the rise at 10% a year-that's behind the recent embrace of nuclear energy. In a briefing to Parliament, Prime Minister Manmohan Singh emphasised "the need for India to have unhindered access to all forms of energy, including nuclear energy, if we are to maintain and accelerate our rate of economic growth".

He isn't off the mark. Over the past decade, about one-third of India's new power supplies came from natural gas and hydro electricity. But prices of natural gas have almost doubled and environmental objections have stalled the government's plans for new dams. That leaves coal-the most carbon-intensive of all fossil fuels. Already more than half of India's new power supplies come from coal, and that could grow rapidly.

That bodes ill for the planet. But there's still hope. The deal with the US could open up access to nuclear technology and nuclear fuels that India needs to increase nuclear generating capacity. Currently, India has just 3 gigawatts of nuclear plants connected to the grid and this could grow ten-fold by 2020. Displacing coal would avoid about 130 million tons of carbon dioxide per year (the full range of emission cuts planned by the European Union under the Kyoto Protocol will total just 200 million tons per year).

Source : The Times of India, New Delhi Wed, June 6, 2007

Turtle recall: India's green warrior

Not every environmentalist gets to have a genus named after her, but J Vijaya has had that rare honour bestowed upon her. One of India's foremost green warriors, vijaya was India's first woman herpetologist.

As assistant to Edward Moll, chairman of the World Conservation Unions Freshwater Chelonian Specialist Group, she undertook a nationwide survey of turtles. She was one of the first people to sound the alarm on the turtle trade in India, photographing the slaughter of Olive Ridley turtles on Digsha beach in West Bengal and the meat markets of Kolkata.

Source : The Times of India, New Delhi Wed, June 6, 2007

Tree gets heritage status

Mumbai: We have seen buildings on the heritage list, old villages being declared heritage precincts, lakes being listed so and even has toy trains on the heritage bandwagon. Well, on the eve of World Environment Day, one tree got that much-deserved recognition. Mayor Shubha Raul and noted classical singer Kishori Amonkar conferred the heritage status on one ajan tree in Dadar. There are only two ajan trees in the city; the other is on private land in Powai.

"There is no programme or activity to recognise the beauty, the history and the worth of

a tree despite the immense pleasure it gives us. We thought we would have a new concept of according heritage status to trees, "taxonomist and writer of books on trees Marselin Almeida said.

The 45-year-old ajan was not chosen randomly. It was planted in 1962 next to a Dnyaneshwar temple in Dadar. Legend has it that Sant Dnyaneshwar, while on his way to take samadhi, pulled out a branch of the hitherto unknown tree to use it as a walking stick. He planted the branch at the samadhi site, where a tree grew.

And, since no one knew the tree's name, it was popularly called ajan (unknown in Marathi). Its scientific name is *Ehretia laevis* and it gives white star-like flowers between January and October.

The listing of the trees is not official as it has not been endorsed by the Mumbai Urban Heritage Committee. But the landscaping consultancy firm that has started the concept plans to list 40 more trees in Mumbai. Baobab trees, planted by the Portuguese and rain trees planted in 1935, will also be on the list.

Source : *The Times of India*, New Delhi Wed, June 6, 2007

Editor

Cheetal

Young Readers Section

Should man Conquer Nature?

**Sumit Sinha*

Should man conquer nature? This is the question we are trying to answer here. But implicit in this question is the assumption that man is at war with Nature? The antagonism between man and nature is presupposed. And this is the root cause of all our troubles. Let us see how.

If we presume that man is at war with Nature, then there is no other option but to conquer it for the sake of our survival. But what if this presumption is an exaggerated sense of paranoia of man? A diseased state of human mind? A persecution complex? What then? Then mankind will spend itself in conquering the non-existent war with Nature. So, the question 'Should man conquer Nature?' reduces to 'Is man at war with Nature?' in essence. Let us try to answer this.

The origin of the assumption that man is at war with nature dates back to the very origin of man. The primeval man was afraid and helpless in front of Nature's forces. The only way he could reconcile with this was to worship it as a Force. This attitude more or less continued till science gave the humans the tools to confront and 'conquer' it. He could escape floods and droughts, combat various diseases and this gave him a confidence like never before. As a result we now see things differently. We have placed man against Nature. Nature with its deadliest of deadly weapons like floods, tornadoes, earthquakes, droughts, diseases and so on. These all appear to be bent upon destroying human existence and we no longer try to appease them with prayers, we try to 'conquer' them. Man is a born winner or at least he thinks so. He has seen such things from time immemorial, he has survived these and he will emerge winner in the future too. Isn't this what many of us suppose? But some other learned men see things differently. They say 'Mother Nature' with a sudden softness and respect in their voice. Mother they call it because she feeds us, pampers us and cares about us. So what is the truth? Is Nature an enemy or a Mother? Or simultaneously both? Or none? The answer is none. It cannot be our enemy because our own existence depends upon it. Every breath we take is of course a complex mixture of gases carefully mixed so as to make it a life-giving potion. The food we eat is even more complex gift for our survival. So the Nature appears to be a Mother but actually no. Because the air we breathe was not designed for the purpose of our breathing neither the food we eat was intended to feed hungry men. The human species has found a way of living with them, because if we weren't able to utilize them we would have been finished for good. And we came to gain these abilities through Nature's process of evolution. Just like so many other species on this planet! Nature is neither an enemy nor a Mother but a neutral force

which creates and sustains all the species of this planet and we need to understand this force to live with it properly.

Humans are desperate to live. In fact we all want to live; and when I say 'we', it also includes all the living beings that exist today -the amoeba that causes dysentery, the limbless snake, the mould growing on our breads and the birds that chirp and sing. Everyone wants to live, but no one interferes with Nature the way man does. Humans don't want to die even when Nature wants them to. For this we clash with Nature.

Man has ended up in a negative role vis-a-vis Nature and we are playing it out beautifully. We have made 'resources' out of other species of plants and animals and have no compunctions in exploiting them. But one might argue that this process is a part of food chain, every species acts as a source of food for some other species. Why blame only humans? Here we need to realize that every species contributes to nature, everyone who eats also gets eaten as a part of the chain. But not humans. Man is terminal in the food chain. You remove man from Nature and life will continue without a hitch. You remove frogs and all the species of that ecosystem will perish; life will crumble because the chain will be broken. Our planet will become just another heavenly body in the sky. In this way man is useless in nature but this does not effect Nature much until man starts to affect Nature itself. This means that we are not supposed to interfere with Nature. But in his desperate attempt to conquer Nature, man has disturbed the natural equilibrium. He wants an easygoing life. Tick Tock, He needs homes to live and fields to grow food, so he clears forests; he needs a rocking chair so he cuts trees: other animals are a nuisance to him so he doesn't want them either..

Man needs business, since there is a huge market for products for a huge population. Products are made from natural resources (if at all we are supposed to call them resources!). The major watershed in this direction was the industrial revolution during eighteenth century. This combined with the then dominant religio-philosophical view that man is the center of the universe, that all bounties of Nature are meant for his pleasure, has accelerated this downfall. Since the industrial revolution, world has become a global market (and a global dumping ground too!). Machines must make products; products must be moved from this corner of the planet to that. This entails burning of more and more fossil fuels (which we learnt to draw from deep beneath the earth's surface). This means more and more pollution, more release of green house gases into atmosphere. This pollution is mostly responsible for disturbing the natural balance of gases and elements. The green house gases like carbon dioxide, nitrous oxide, methane etc are produced by anthropogenic processes like rapid industrialization, burning of fossil fuels and deforestation etc. These severely affect Nature by trapping heat energy and resulting in rise in sea levels due to melting of polar ice caps and glaciers. This causes changes in climatic patterns and occurrences of freak cyclones and tropical disturbances. And we blame Nature for this!

Similarly, the use of chloro-fluoro- carbons(CFC's) - a major industrial and household chemical, has led to the depletion of ozone layer to as low as 50% at some places. The UV rays freely enter the atmosphere and play havoc by causing diseases like cancer in all living species and destroying plant life. Even the rivers are so much polluted by human activities that it is now

beyond Nature's power to cleanse them. Most of the rivers today contain toxic metals such as ammonia, cyanides and organic wastes etc., most of its coming from industries like heavy metals, pesticides, fertilizers etc. In India alone, millions of liters of untreated sewage are being dumped into the rivers. But who cares?

Nowdays it is raining acid in our metros. Literally. Nature has gone berserk. Weren't she supposed to rain water instead of acids? Why is she behaving so erratically all of a sudden? Let us see. The pollutants like sulphur dioxide, nitrogen oxides and aerosols released by human activities accumulate in atmosphere and react to form acids, causing acid rains. It increases the acidity of the aquatic medium, so that the already frail Aquatic life system is threatened. Plankton, algae, crustaceans and fishes etc. which survive in a narrow pH range(acidity levels) have reached the brink of extinction.

So this is what is being done in attempt to conquer Nature in the name of so called human progress. Sadly, all such problems increase multiple times with increase in human population. Unlike other species, man cannot keep his population in a constant sustainable equilibrium. Man just multiplies and multiplies, utilizes all available resources of a particular area until they are finished. Then he spreads to other parts of the planet, proliferating like a cancer.

We refuse to see it, but nature has started to collapse since the arrival of industrialized humans. We have made a mess out of nature trying to handle and control it. And we are not in a mood of stopping even now! We are learning still newer ways to clash with Nature. The introduction of nuclear energy is certainly the quickest way of bringing destruction. The nuclear wastes are being accumulated beneath our soils and seas, raising the temperature of the oceans considerably and causing grand malfunction of natural cycles. The deadliest arsenal of man- the nuclear bomb is bound to explode sooner or later because man loves war. He has used bombs earlier also and will do it in the future also. If such a scenario happens, the temperature of the earth will be raised by several times followed by a nuclear winter. The climate cycle will come to an abrupt end, sun's energy will not reach the earth's surface, water bodies will be contaminated and every form of life will vanish forever.

May we ask ourselves who we are to play with Nature in such an irresponsible manner? We should try to answer some very uncomfortable questions without any prejudice:

Is nature our ancestral property?

Is there any need to tamper Nature to fulfil our greedy progress?

Who has given us the authority to do so?

Who is responsible for the damage done so far?

What is going to be the end of this story?(If nothing is done now, there is certainly going to be an end to this sorry story.)

What shall we do now?

This is the million-dollar question- what shall we do now? Is there any getting back? Can Nature be restored? The situation is grim and steps must be taken now.

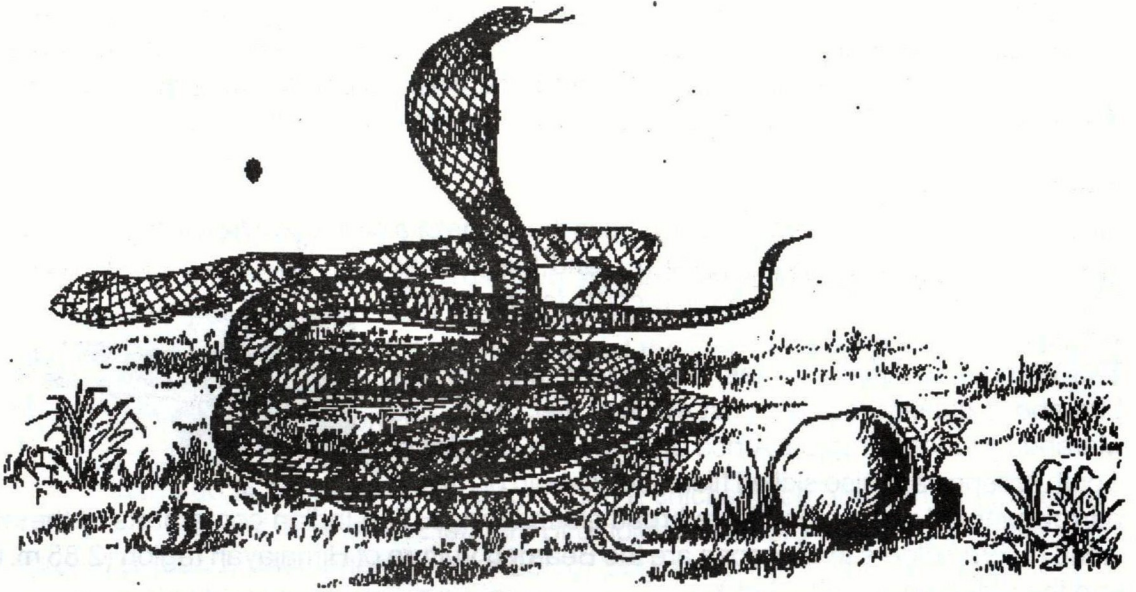
Universal laws should be formed to protect Nature, laws that do not change from country to country, be it developed or third-world. Everyone must abide by these laws. Minimum forest

area must be ensured and maintained in each country. Industrialization must be controlled. Unnecessary experiments with Nature must stop. Methods must be devised to control and decrease existing pollution. But doing all this will not be easy. We have formed committees and participated in conferences, made laws and laid conventions. But all on paper. Also, the awareness levels of the public are depressingly low. Let the general masses know the real situation. Most of us are living with a false belief that everything is going to be all right. Man has conquered Nature before and will surely find an answer to this problem now also. But the real problem is that most of the people don't even know that there is a problem in the first place. There are others who simply refuse to acknowledge this due to their vested interests. Conventions would be put up and laws would be made but what is important is to enforce them. It is our moral and ethical responsibility to abide by them.

If we still wish to conquer Nature then definitely we are on a road to nowhere. There have been many examples earlier when man thought himself in control of Nature but was severely disillusioned. In medical sciences for example. Man used drugs and antibiotics to treat and conquer many diseases but they sprung up again, in forms resistant to all our latest drugs. So we must learn that we cannot compete with Nature because we ourselves are nothing but a creation of Nature.

We now realize that the war with Nature will be not only self-defeating one but also actually a self-annihilating one. We need to change our arrogant mindset and realize our position in the grand scheme of Nature. We must realize that the 'resources' of Nature are limited and are not intended for sole use of humans. All species have an equal right to them. We have to keep a symbiotic and cooperative relation with nature as all species do. We have to move from blind progress towards a modal of sustainable development. Only then is there any hope for our survival.

It's a beautiful world and if we open our eyes and see carefully enough, we will find green letters inscribed on it saying- "Fragile. Handle it with care."



सांप अपनी केंचुली (Skin) क्यों बदलते हैं?

सांप रेंगने वाले ऐसे जंतु हैं, जो जमीन के ऊपर और नीचे, पानी में और पेड़ों पर रहते हैं। इनकी दो हजार से भी अधिक किस्में हैं। इन सभी सांपों में केंचुली बदलने का गुण होता है। क्या तुम जानते हो कि सांप केंचुली क्यों बदलते हैं?

सभी सांपों का एक गुण है कि सारे जीवनभर उनका शरीर बढ़ता रहता है। यहां तक कि सांपों का शरीर वृद्धावस्था में भी बढ़ता ही रहता है। इस उम्र में शरीर के बढ़ने की दर युवावस्था की अपेक्षा कम हो जाती है। शारीरिक वृद्धि के कारण उनकी त्वचा छोटी पड़ जाती है, अतः यह अपनी बाहरी त्वचा एक निर्धारित समय के बाद छोड़ देता है। इसी को सांप का केंचुली बदलना कहते हैं। सांप एक से तीन महीने की अवधि में केंचुली बदलते हैं।

सांप अपनी केंचुली बड़े ही दिलचस्प ढंग से बदलता है। जब सांप को केंचुली बदलनी होती है, तब वह अपने मुंह को किसी खुरदरी जगह से रगड़ता है। इससे होंठों के पास की खाल ढीली हो जाती है। तब सांप खाल के उस हिस्से को किसी चट्टान या पेड़ की टहनी से अटका देता है। इससे उसके मुंह के पास कुछ रास्ता सा बन जाता है। इस स्थिति में वह अपने शरीर को सिकोड़ कर त्वचा से बाहर निकाल लेता है और उसकी त्वचा चट्टान या टहनी से अटकी रह जाती है। केंचुली बदलने की क्रिया में केंचुली का अंदर का भाग बाहर और बाहर का भाग अंदर अर्थात् उसकी त्वचा उल्टी हो जाती है। इस प्रकार त्वचा बदलने में केंचुली कहीं से भी टूटती नहीं है।

Super Birds

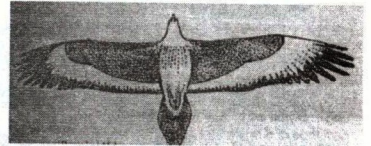
The Earliest Known Bird

Most scientists agree that birds evolved from reptiles millions of years ago. The earliest known bird was Archaeopteryx. It lived about 160 million years ago during the Age of Dinosaurs. Archaeopteryx had many reptile-like features, such as bones in its tail, sharp teeth, and hooked claws. But it also had feathers, which is one of the reasons why it is considered a bird. Scientists think it was one of the first birds to have evolved.

The Largest Wingspan

Wingspan is the measurement right across the wings of a bird. The Wandering Albatross (3.65 m), the Marabou Stork (3.04 m), and the Andean Condor (3.04 m) hold the three top records for the largest wingspans in the world.

The Wandering Albatross has the longest wings of any bird and is considered the most efficient flier of all. The Marabou Stork of Tropical Africa and Andean Condor of South America are also skilled fliers, but instead of having narrow pointed wings, they have broad slotted wings. The Indian counterparts of these world record holders in wingspan are the Bearded Vulture of Himalayan region (2.85 m.) and the Black Vulture (2.73 m.).



The Tallest and Heaviest

The largest bird living today is the Ostrich. Males can grow to heights of over 2.4 m and weigh over 155 kg. But the Ostrich is not the all-time record holder. The tallest bird ever to live was the Moa of New Zealand. It grew to heights of over 3.6 m and probably weighed over 225 kg. And the Elephant Bird of Madagascar, was the heaviest bird ever to live. Some scientists think it weighed about 454 kg. (half a ton). Both these birds are now extinct. The tallest Indian Bird is the Sarus Crane, approximately 1.56 m. While the heaviest bird is the Great Indian Bustard male, weighing around 18 kg.



The Smallest Bird

The Bee Hummingbird of Cuba is the smallest bird in the world. It has a total length of 5 cm including its tail and its long bill. This tiny bird weighs about 2.8 g. That is about as much as a table tennis ball. India's smallest bird is the Scarletbacked Flowerpecker which is 7 cm long from beak to tail, and weighs 4-6 gm. (less than half a tola). It is found in Eastern India.



The Fastest Fliers

The swift family includes some of the fastest fliers in the world. Some have been known

to fly over 160 km per hour. Swifts spend most of their time "on the wing" (in flight catching flying insects). In fact, they hold the record for spending the most of their time in the air.

Three of the swifts found in India e.g. Whitethroated Spinetail Swift (The Himalayas), Brownthroated Spinetail Swift (East India and Western Ghats), and Alpine Swift are among the fastest flying birds of the world. Pregrine Falcons are the fastest diving birds in the air. When they swoop down on their prey, they can approach 320 km per hour.

The Largest Eyes

Birds have very large eyes in proportion to their bodies. Most of a bird's eye is hidden in the eyelids and the skull so it looks smaller than it really is. Some birds of prey and some running birds have bigger eyes than we do, and can see a lot better. Ostriches have the biggest eyes of any land animal alive today. Each one is over 5 cm in diameter-about the size of a tennis ball.



The Largest and the Smallest Eggs

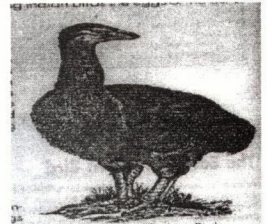
The Ostrich holds the record for having the largest eggs of any living bird. The egg is about 15 cm long with a very thick shell.

One ostrich egg is about 20 times bigger than a chicken egg and can weigh between 1.3 kg to 1.9 kg. But the extinct Elephant Bird holds the record of having the largest bird eggs ever found. Each one was over 25 cm long and could hold more than 7.6 litres. Among Indian birds the eggs of the Sarus crane are the largest, being about 10.4 cm long.

The tiniest eggs belong to the tiniest of the birds-the hummingbirds. Their eggs are smaller than pea beans. The smallest eggs among Indian birds are those of the Scarletbacked Flowerpecker measuring 1.4 cm in length.

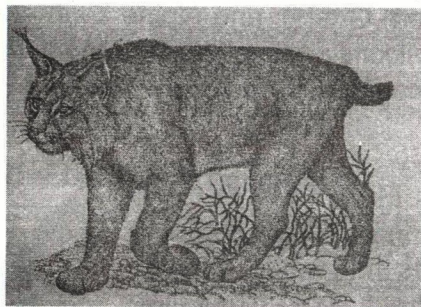
The Fastest Swimmers

Many birds can swim underwater using their wings as flippers. The fastest swimmers are penguins. Penguins are streamlined like missiles, and they can zip through the water at speeds of over 40 km per hour. Auks, diving petrels and gannets also use their wings under water.

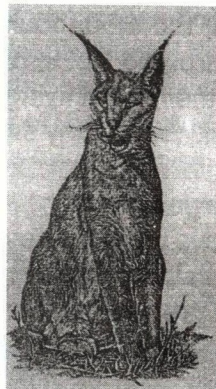


After discussing each category, ask the students what all these birds have in common. (All are warm-blooded and have feathers, beaks, wings, two legs, scales on their legs and feet, and many similar internal features, such as lightweight bones, fused bones, air sacs and gizzards).

Wildlife Photo Series for Identification Cats (Part II)



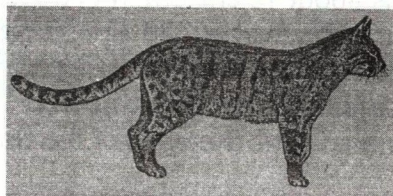
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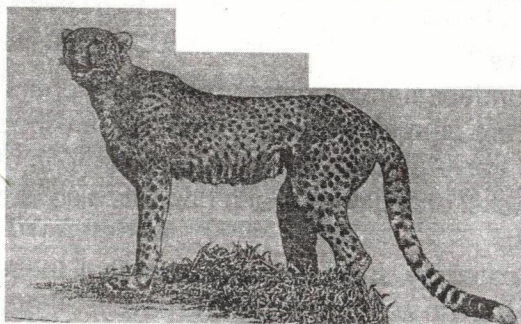
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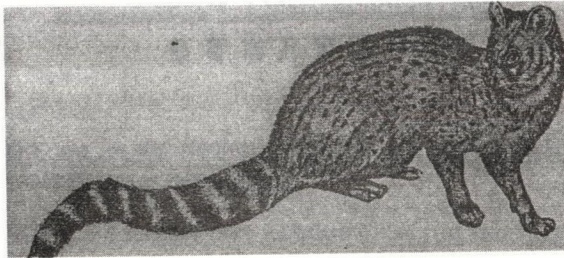


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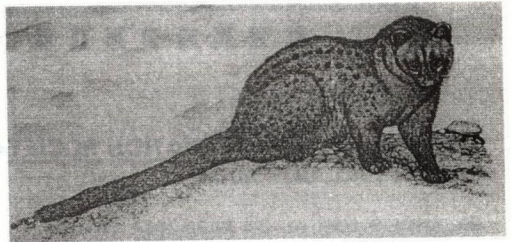
1. The Lynx, *Felis lynx* Local Name Kash, *patsalam*; Lahul *phiauku*
2. The Caracal *Felis caracal* Local Names. Hindi & Persian *siyeh gush*.
3. Pallas's Cat *Felis manul*
4. The Desert Cat *Felis libyca* Local Names *Cutch jhang memo*
5. The Cheetah, or Hunting Leopard *Acinonyx jubatus*

Wildlife Photo Series for Identification

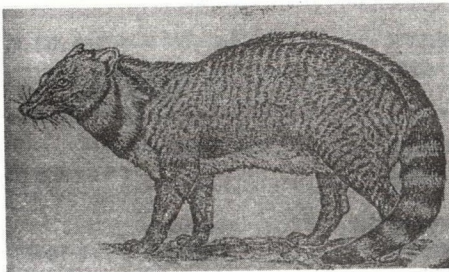
Civets



6



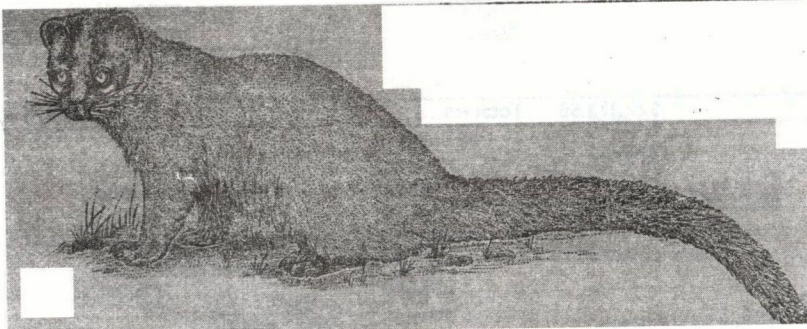
7



8



9



10

6. **The Small Indian Civet** *Viverricula indica* **Local Names.** Hindi *kasturi*; Ben. *gando gaula*, *gandhagokul*; Deccan *mushak billi*; Mar. *jowadi manjur*; Kan. *poonagubekku*, *poonugu kTotthi*; Tel. *pungu pilli*; Tamil *pungu poonay*; Mal. *neru*; Bur. *chaung kado*.
7. **The Common Palm Civet, or Toddy Cat** *Paradoxurus hermaphroditus* **Local Names.** Hindi *lakati*, *khatas*; in the South *menuri*; Ben. *bhondar*; Mar. *ud manjar*; Kan. *mara bekku*, *mantta*; Tel. *manu pilli*; Tamil & Mal. *marranai*, *marra meru*.
8. **The Large Indian Civet** *Viverra zibetha* **Local Names** Hindi *kattas* (used for several other animals also); Ben *mach bhondar*, *bagdos*, *pudo gaula*; Nepal Terai *Bhnan*; Bhotia *Kung*.
9. **The Binturong, or Bear-cat** *Arctictis binturong* **Local Names.** Assamese *young*; Bur *myouk kya*.
10. **The Himalayan Palm civet, or Masked Palm Civet** *paguma larvata*

Sachin Agrawal & Co.

CHARTERED ACCOUNTANTS

THE WILDLIFE PRESERVATION SOCIETY OF INDIA 7 ASTLEY HALL, DEHRADUN

BALANCE SHEET AS ON 31.03.2007

LIABILITIES	AMOUNT	ASSETS	AMOUNT
GENERAL FUND :		FIXED ASSETS	
Opening Balance	95,465.29	[as per schedule]	159,803.00
Less : Deficit for year	(73,091.63)		
	22,373.66		
Wild Life Up Keep & Protection Fund		INVESTMENTS	
Last Balance	300,000.00	FDR with PNB	62,446.00
		Intt Accrued on FDR	3,680.00
		Add : Intt CY	4,460.00
			8,140.00
		CURRENT ASSETS :	
		Cash in hand	1,142.37
		PNB 650780	
		Astley Hall, Dehradun	90,782.29
			91,924.66
		Security Deposits :	
		Electricity	40.00
		Water	20.00
			60.00
Total Rs.....	322,373.66	Total Rs.....	322,373.66

Dated : 04.05.2007

President

Secretary

Treasurer

Refer to our audit report of even date .

for Sachin Agrawal & Co.
Chartered Accountants[Sachin Agrawal - FCA]
Mem no 078414

Sachin Agrawal & Co.

CHARTERED ACCOUNTANTS

THE WILDLIFE PRESERVATION SOCIETY OF INDIA

7 ASTLEY HALL, DEHRADUN

INCOME & EXPENDITURE ACCOUNT FOR THE YEAR ENDING 31.03.2007

EXPENDITURE	AMOUNT	INCOME	AMOUNT
Printing of Cheetal Magazine	73,632.00	<u>Membership Fee</u>	
Printing & Stationery	1,162.00	Annual	9,070.00
Cost of Silver Medal	725.00	Student	300.00
Postage & Telegram	17,413.00	Life	44,250.00
Water, Electricity & House Tax	5,151.00	National History Museum,	
Electricity Repair	910.00	London (GBP 120)	10,106.00
Office Expenses	713.00	Bird Life International	
Sweeper salary	2,400.00	UK (USD 60)	2,488.00
Honorarium	12,800.00	Institutional	8,620.00
Society Registration Expenses	7,900.00		74,834.00
Telephone Expenses	2,513.00	Royalty Income	
Building Repair	300.00	From National Book Trust	897.00
Audit Fee Paid	1,347.00		
Conveyance Allowance	295.00	Sale of Old Material/ Cheetal Book &	
Meeting Expenses	473.00	Photographs	5,305.00
Bank Charges	205.00		
		Intt on SB a/c	4,757.00
<u>Expenses on Mountain Quail</u>		Intt on FDR (Accrued)	4,460.00
Labour Charges	25,000.00		
Petrol Expenses	208.00	Deficit being excess of Expenditure	
Other	1,719.63	over Income	73,091.63
Depreciation as per schedule	8,538.00		
Total Rs....	163,404.63	Total Rs....	163,404.63

Dated : 04.05.2007

Refer to our audit report of even date .

President:

for Sachin Agrawal & Co
Chartered Accountants

Secretary

Treasurer

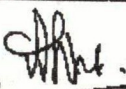
[Sachin Agrawal - FCA]
Mem no 078414

THE WILDLIFE PRESERVATION SOCIETY OF INDIA
7 ASTLEY HALL, DEHRADUN

SCHEDULE OF FIXED ASSETS AS ON 31.03.2007

Particular	Balance as on 01.04.2006	Addition	Total	Depreciation	Balance as on 31.03.2007
Building	15,930.00	150,000.00	165,930.00	8,297.00	157,633.00
Library Books	953.00	-	953.00	95.00	858.00
Furniture & Fixture	299.00	-	299.00	30.00	269.00
Typewriter	1,159.00	-	1,159.00	116.00	1,043.00
Total	18,341.00	150,000.00	168,341.00	8,538.00	159,803.00

Dated : 04.05.2007

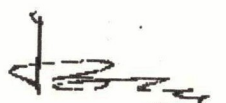
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Refer to our audit report of even date.

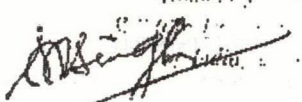
President

for Sachin Agrawal & Co.
Chartered Accountants

Secretary


Secretary

Treasurer


Treasurer

[Sachin Agrawal - FCA]
Mem no 078414

The Wildlife Preservation Society of India

1. The aims and objects of the Society are as follows :-

- (a) To promote interest and impart knowledge regarding the preservation and conservation of all forms of wildlife, particularly among the youth of the country.
- (b) To cooperate with the Govt. of India and State Governments and with others Societies and Institutions having similar aims and objects in working for the interests of wildlife.
- (c) To assist in enforcing and actively supporting the Forests Acts. Wild Birds and animals Protections Acts and Rules etc. of State Governments and the Indian Arms Act and Rules in so far as they pertain to wildlife and to bring to the notice of the authorities any infringement of the same and to assist in the detention and prosecution of offenders in respect of such laws.
- (d) To advise and help the Govt. and wildlife administrators in the formation, maintenance and protection of Sanctuaries and National Parks, preservation of wildlife in general and endangered species of India in particular and in the introduction of exotic species into the country, rehabilitation of endangered species etc. and in the formulation and amendments of rules and acts, so as to conserve and increase wildlife stocks.
- (e) To raise funds for carrying out the above aims and objects and to found and maintain museums reading rooms and libraries of natural history in order to disseminate knowledge regarding wildlife.
- (f) To carry out publicity and propaganda for the preservation of wildlife in India by means of monographs, journals, films, filmstrips and other feasible methods.
- (g) To assist members of the Society in obtaining facilities for viewing and photographing wildlife in India.
- (h) To conduct research into the problem of Wildlife management in India, and in pursuance of this, to initiate, encourage and, where possible assist in the projects of the study of threatened species and related objects and to provide reference and research facilities for such work.
- (i) To carry on such other activities which will serve the above subjects.

2. What membership of Wildlife Preservation Society of India will entitle you to ?

- (1) You will become an active member of the growing group of Wildlife enthusiasts, who enjoy working for and spreading the knowledge of how to conserve India's heritage of wildlife for posterity.
- (2) You will be entitled to the full use of the library of the Wildlife Preservation Society and of its reading room.
- (3) You will receive a membership certificate.
- (4) You will receive a personal Identification and Membership Card.
- (5) You will be entitled to buy all publications of the Society at a concessional rate.
- (6) You will be entitled to buy at concessional rates the Societies Greeting Cards, Calendars. Tie, Label badges and the Balance of Nature Game (specially Published in colour for its educative and recreational values).
- (7) You will be supplied "Cheetal", the quarterly journal of the society free.

3. For membership particulars write to Honorary Secretary, Wildlife Preservation Society of India 7 Astley Hall, Dehra Dun.

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Shri N.N. Goel Advocate
11-A Nemi Road
Dehradun - 248 001

Executive Vice President

Shri A.S. Negi, IFS (Retd.)
Advisor (Wildlife) Govt. of Uttarakhand
300 Model Colony, Araghar
Dehradun - 248 001

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Shri Ravi Singh
Secretary General & CEO, WWF- India
172, B Lodhi Estate
New Delhi - 3

Shri P.R. Sinha (Ex Officio)
Director, Wild Life Institute of India
Post Box 18, Chandrabani
Dehradun

Dr. B.S. Barfal, IFS
Principal Chief Conservator of Forests, Uttarakhand
85, Rajpur Road, Dehradun - 248 001

Shri S. Chandola, IFS
Add. PCCF & Chief Wildlife Warden, Uttarakhand
Camp Office-Chandrabani, Dehradun

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Dehradun - 248 001

(Ex Officio) Hon. Asst. Secretary

Shri Narendra Singh
21/2-3, Teg Bahadur Road No.4
Dehradun - 248 001

Honorary Treasurer

Dr. S.P. Singh
9A Sewak Ashram Road,
Dehradun - 248 001

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2. Sri. I.S. Negi

3. Dr. S.P. Singh

